

Community Colleges as Labor Market Intermediaries: A Comparative Case Study of
Departmental Activities in Reducing Labor Market Gaps

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Community Colleges as Labor Market Intermediaries: A Comparative Case Study of
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Summary

Labor market intermediaries (LMIs) have taken on a greater role in regional labor markets as flexibility of work has increased over the past thirty years. These shifting roles necessitate a greater look at institutions that act as LMIs and the services they perform for workers and employers. Community colleges have recently been highlighted as one of the institutions serving workers that offer market molding activities, going beyond more traditional LMI market matching activities. This study compared four LMI placement and career activities – project based learning, internships and cooperative education, specialized accreditation, and industry advisement through councils – for five similar programs of study at community colleges in the City University of New York (CUNY) system to analyze the effects of these activities on employment placement. Greater utilization of these activities by community college departments was found in most cases to be beneficial for students as it regards employment placement in career fields related to the field of study. Activities that were successful in encouraging students to take part in forms of assessment of job-readiness, either through existing standardized testing of job skills or actual work experience, were found to be particularly valuable. These outcomes suggest that mature industries and occupations with established forms of assessment are more likely to provide a smooth transition from degree attainment to employment. Implications for community college administrators and funders are discussed.

Chapter 1: Introduction

With the announcement of the now stripped down American Graduation Initiative, President Barack Obama brought attention to the continued concern of America's economic leaders that the country does not lead the world in college graduates anymore, and the role that community colleges can play in upgrading our human capital infrastructure. While the aggregate graduation rate in the country is perceived as weak today, certain areas have been left behind their peers for decades. As the "new" information economy has dawned, lower income areas of inner cities have been caught behind the rest of the country in acclimating due to the large investment necessary in human capital, a major source of disparity within regions. One of the most important means of combating human capital deficiencies in inner city communities has been community colleges. Affordability, open access, and flexibility have made community colleges a stepping stone in poorer areas to help individuals achieve socio-economic mobility.

As community colleges have gone beyond their traditional roles as educational institutions devoted to four year institutional transfer into the realm of vocational training, some institutions have trouble reconciling these "conflicting" missions. Other institutions have accepted the vocational mission and have found complementary operations amongst multiple missions, carving niches within their regional economies and serving as labor market intermediaries. In this role community colleges take part in reducing gaps in labor markets through career oriented training, education credentialing and a wide variety of other activities, reducing information gathering costs to producers and consumers of labor due to enhanced economies of scale related to their role in labor market transactions.

With the growth of cluster based economic development strategies and increased labor flexibility, local industries in particular benefit from stronger ties with labor market

intermediaries, including community colleges, while students benefit from enhanced employment opportunities. As Benner et al called for, in-depth research of specific aspects of labor market intermediary activities may help to recognize those activities that enhance employment placement and make labor markets more efficient (Benner et al 2007). It is the work of this study to examine some of the functional activities that correspond to the broader, market responsive activities undertaken by labor market intermediaries, thereby adding to the growing empirical body of work on the effect of both labor market intermediary functions and the broader activities they represent (Benner, Leete et al 2007 & Fitzgerald 1998 & Laufer & Winship 2004). If positive relationships can be shown between job placement and certain activities of community colleges, future economic development efforts may gain from promoting strategically enhanced relationships between community colleges and the employer organizations around them.

As a highly developed metropolitan area with a variety of community colleges under the same educational “roof”, New York City serves as an interesting case study for this analysis. There are six community colleges under the City University of New York (CUNY) System that serve four of the five boroughs in New York City under the same cost structure (cuny.edu 2010). Many of the departments within these institutions serve the same types of students and industry, but offer varying approaches on how they perform their intermediary role. In assessing the effects of these local higher education institutions on the job placement of those served in their communities, some conclusions can be drawn as to the success of institutions and departments that focus on market responsiveness, informing future research and policy decisions.

Chapter 1: Literature Review

Economic Development Policy in Cities

Local and regional economic development is one of the responses to the overwhelmingly bleak view of our cities based on studies documenting the loss of population and business investment, segregation, drug abuse and crime, dilapidated housing and schools, and bleak neighborhoods which are centers of concentrated poverty (Euchner and McGovern 2003). On the whole, city crime rates increase, decay and abandonment of poor neighborhoods spread, public schools take on increased strain systemwide, and cities lose tax revenue while public service demand rises. These issues are to say nothing of the lack of incentive for the poor to participate in a social contract because the impoverished become disillusioned and disconnect with formal government altogether (Euchner and McGovern 2003).

Balanced economic growth of regions and urban centers are also important because while money and educated individuals have out-migrated to the suburbs, cities must maintain their status as the center of productivity and innovation in regions. Where economic growth is imbalanced, jobs may be available in one part of the region and unemployment may be rampant in another. This imbalance creates gaps in economic efficiency, hurting cities' competitiveness (Dreier, Mollenkopf et al. 2004).

Public policy has had limited success in decreasing concentrated poverty in central cities since the "War on Poverty" began in 1965. There are myriad reasons for why this has been the case. Chapple and Teitz summarized these hypotheses into eight groups: economic restructuring, inadequate human capital, racial and gender discrimination, cultural and behavioral trends,

spatial mismatch, economic restructuring, in and out-migration processes, endogenous growth deficits, and public policy itself.

Although the authors admit the complexity of the issue make it so that no one hypothesis is itself strictly effective in explaining why policy has failed to cure poverty in cities, two reasons make a stronger case than the others, namely the lack of human capital and economic restructuring (Chapple and Teitz 1998). Economic development policies that aim to attend to the first issue while realizing the lasting effects of the latter one may be better suited to understand the problems of and create solutions to regions' most pressing economic needs. Those economic development policies that overlap and are able to partially incorporate or combat these other hypotheses may also be better prepared to succeed in the long term for reducing inner city blight and increasing the internal strength within America's cities. As an example, the idea that endogenous growth is driven by investments in human capital strengthens the argument that increasing human capital is necessary for poverty alleviation *and* continued competitiveness, instead of focusing on the two as separate problems with separate solutions (Mathur 1999). Certain economic development strategies are more deeply aligned with the pursuit of increased human capital within communities and regions. Here I make an effort to delineate the type of economic development strategy most inclined to be built on efforts to create accumulations of human capital.

Types of Economic Development

Economic development policy is the course of action that is used by government to improve the economic and social assets of communities to promote economic activity and foster conditions for discovery and innovation where people are involved in productive opportunities (Peterson and Gray 1969). One development typology focuses on the source of economic growth, whether

it be an eventual return to natural equilibrium (neo-classical theory), increases in demand from external sources (economic base theory), or the benefits of factors related to location (locational theory).

The theory that will serve as the backdrop for this paper is economic base theory, which posits that economic growth in a community is related to creating demand for goods, services, and products produced internally for areas outside of its boundaries (Blakely and Bradshaw 2002). Local labor and materials that are used in these products and services provide jobs and wealth expansion for the community, city, region, and so forth. The recruitment and expansion of firms that are part of an export base are prioritized due to their ability to create higher economic multipliers, or ripple effects for each dollar, for the local economy. New markets theory, a branch of economic base theory, is the development typology that will guide many of the assumptions in this paper. In “New Strategies for Inner City Economic Development” Porter argues that the economic potential of inner cities is “largely unrecognized and untapped” (Porter 1997). One of the important examples used to express this are blighted communities proximity to downtown districts - areas of concentrated economic activity – that make them possible markets to cater to by engaging in clustering opportunities that firms within downtown districts have already established. Understanding local assets, creating financing mechanisms to aid them, and designing mechanisms for recycling asset created wealth within the community are the requirements for such a strategy to work well (Blakely and Bradshaw 2002).

The focus on strengthening local assets and the ability for new markets theory to incorporate valuable lessons from other economic development theories make this the most intriguing path towards development for inner city communities. Although Porter’s solutions are the core of new markets theory, his reliance on the pillars of the other two development theories are obvious.

Increased flow of capital into these neighborhoods, a natural by-product in neoclassical economic theory, is one of the goals of new markets theory; the importance of location as a “competitive advantage” in bringing in and retaining assets in neighborhoods is also noted as an important factor by Porter (Porter 1997). This paper will identify with Porter’s analysis to a point, with a strong emphasis on creating local economies that use their human capital assets to take advantage of economic restructuring as it has occurred. The two recommendations for government under this theory are to train workers and create a favorable environment for business (Porter 1997). The role of publicly funded community colleges in training individuals, enhancing productivity of the local labor pool, and reducing the search cost for employers can be realized through this strategy.

It is important to understand the critiques of Porter so that they may be accounted for, and where necessary, adjusted to better aid urban community development. The critique of Porter’s argument that most relates to the subject of this paper is the “importance of human resources” as noted by Robinson Barnes (Robinson-Barnes 1996). This critique offers that rather than business development, which Porter is focused on in his analysis, a more comprehensive form of economic development is able to take form when the focus is on human resources. In doing so, the efforts at aiding inner city communities go beyond smaller scale programs that cater reactively to business needs, and instead instill skills in workers that are transferable and dynamic, upgrading the local level of human capital. I agree with Robinson-Barnes in her assessment of education and training as being characterized as social programs when they are actually forms of economic development. The “silo” effect of separate agencies exacerbates these problems; a properly functioning human development program will be made through partnerships of stakeholders in the process (Robinson-Barnes 1996).

Local and Regional Development (LRED)

As economic base theory is focused on spatially bounded areas, local and regional economic development is the vehicle for realizing desired economic change. One of the arguments for this form of development is that growth initiatives are best undertaken at the local level because of the increased understanding of historical causes and available local assets, and the ability to create targeted approaches to localized problems. Although cities and regional entities are unable to change economic structure, they are best suited to align their resources to match global needs (Blakely and Bradshaw 2002). It is this ability to maintain market responsiveness locally that makes LRED the focus of this paper.

There has been a shift in focus on the role of information to enhance development efforts through asset building in urban markets in recent years, with efforts like the Urban Markets Initiative by the Brookings Institution. The goal of this initiative and others like it is to make better use of available strengths so that inner city markets are enhanced, and local assets are leveraged to connect with broader economies (Weissbourd and Bodini 2005). This in turn aligns LRED interests with local businesses, boosting underutilized assets, and providing market opportunities for expansion. The ability for information to enhance markets comes from “changing the conditions of production, exchange, or consumption in ways that allow market activity to include new people, assets, or places”, which speaks to the direst needs of underdeveloped communities (Weissbourd and Bodini 2005) and can be taken up by the institutions within these localities to enhance their effectiveness.

LRED strategies, in building on areas of existing strength, are strongly focused on enriching industry and occupational clusters. Industry clusters have been defined as “geographic concentrations of competing, complementary, or interdependent firms, and industries that do

business with each other and/or have common needs for talent, technology, and infrastructure” (Munnich Jr., Love et al. 1999). While this definition captures the essence of an industry cluster, external institutions, including governments, NGOs, educational institutions, and peripheral industries and businesses, all contribute to the growth and strength of clusters, which are fluid.

In a report on the benefits of clusters in Minnesota, the authors explicitly recognized the ability and need for such strategies to address current and projected workforce shortages. Well-developed cluster strategies help prioritize resources so that cluster growth is bolstered. An example would be workforce development initiatives to address labor shortages from within the local labor force. Cluster strategies can enhance regional economic strength by helping to coordinate labor supply and demand, aggregating regional workforce needs of local industries, rather than specific firms, and providing “cues to students and current workers on future employment options and opportunities” (Munnich Jr., Love et al. 1999). Concerns over labor costs and the existence of skilled labor are considered some of the most important reasons for site selection decisions by employers (Levine 2009). Efforts to alleviate these concerns and build a large pool of qualified labor from which employers can choose from to maintain growth and flexibility are excellent traits for regions to recruit and retain firms.

The second type of cluster strategy for regions is strongly related to the development of human capital and related knowledge assets in the forms of clusters of occupations. Strong arguments have been made for adding occupational clusters to economic development strategies due to shifts in economic structure, including the decreasing commitment of firms to localities and the ability for individuals in occupations to work in a variety of industries (Markusen 2002).

Moreover, Markusen & Barbour found that for certain industries, regional occupational structures are indicative of local industry strength, especially where the industry has followed

patterns of vertical disintegration. Finally, where efforts to coordinate and merge economic development and workforce development efforts have taken place, research of both are helpful for supporting strategies that take into account a variety of regional factors (Markusen and Barbour 2007).

Regional Labor Markets and Intermediary Roles

After touching on the benefits related to coordinating economic development strategy at a regional level and the importance of a trained labor force within the region for firm expansion and recruitment, I step back to reflect on regional labor markets and the increasing roles of intermediaries within them. While this paper does not attempt to embark on criticizing or promoting any one set of economic models, noting the economic models that may contribute to understanding how labor market intermediaries operate within the market are helpful to describe the different capacities these organizations play.

Under neoclassical microeconomic competitive models, labor markets have been analyzed as frictionless markets, where decisions to exit by participants in the labor market are based on the accruing utility to the individual to substitute work for home (Cain 1976). Economists focus on the individual decisions of employees and employers to enter and exit markets under this model. More recently, information and signaling theory (Spence 1973) and matching and search theory (Mortensen & Pissaderes 1999) have been developed in an effort to elucidate phenomena that are more difficult to explain using the more classical model. Signaling attempts to explain how market “signals” reduce information asymmetries in labor markets while search theory explains how “match specific rents” are created through employer and employee bargaining. Both of these models have consequences for the roles of intermediaries within them.

It is helpful here to understand the role of intermediaries in markets beyond labor, to clarify how they function and in what capacity intermediaries enhance market efficiency. In cases where market friction exists, a buyer has to undertake an inspection process, while a seller must incur a cost from “showing” the good or service. Where a transaction between the two is not undertaken, both parties incur a cost that does not generate a gain. In addition, there is information captured that would create value to other parties, were it available. Intermediaries are able to emerge in these situations and “internalize the information externality” (Shi and Sio 2010). This information internalization is continually enhanced as intermediaries collect greater information on the product than would be allowable through one on one private market interactions; because of their knowledge of available goods by sellers and the concerns and needs of buyers, intermediaries have greater economies of scale in accumulating information. These economies of scale allow the intermediaries to reduce the transaction costs for all parties compared to if they performed these activities “one on one”, reducing search friction in the market by matching buyers and sellers based on this knowledge (Shi and Sio 2010).

Signaling, as a method for increasing information through certifications of quality, works to reduce the information asymmetries involved in the transactional process. These certifications reduce uncertainty and related friction in markets through a standardization of at least minimal quality. In doing so, information asymmetries between the buyer and seller are reduced, creating more efficient markets. Existing labor markets are riddled with information asymmetries between buyers and sellers and as such necessitate these forms of confirmation of quality (Benner et al 2007).

It is in this context we investigate labor market intermediaries and where possible, note differences in their structure to identify which LMIs are most likely to succeed in this role, while

elaborating further on how certain LMIs may contain other functions which further enhance the benefits to employers and workers.

Labor Market Intermediaries

As more nuanced economic models have emerged for the incorporation of search friction in understanding labor markets, greater attention has been paid to the third parties that help narrow labor market gaps by matching workers and employers (Benner, Leete et al. 2007). “Matching” or “job brokering” as it is also known, is only one – albeit the most ubiquitous – of the functions labor market intermediaries may undertake. A second approach of LMIs is to improve the ability of the labor force through skills development, while working to provide training better suited to responding to employer needs. In some cases, intermediaries also certify the quality of training, enhancing signals in the transactional labor market process. Changing “employer demand for labor” through advocacy is a third possible function for LMIs (Kazis 1998). Benner et al.’s work on LMIs, which was more heavily focused on LMIs and their role in enhancing labor markets to benefit *disadvantaged* workers through career oriented “tracks”, expanded the scope of LMI functions to include the provision of benefits or “support services” (Benner, Brownstein et al. 2001). This role may be roll included in the advocacy approach to form an “advocacy and support” role for LMIs, going beyond calling for enhanced benefits for workers by setting up mechanisms to do so, improving workers’ ability to succeed in employment.

For the sake of this paper, we will use the definition of LMIs as outlined by Benner et al, as “organizations – public, private, nonprofit, or membership based – that help broker the employment relationship through some combination of job matching, training, and career services” (Benner, Leete et al. 2007). Although certain labor market intermediaries are commonly associated with each function – temporary staffing services match, community

colleges train, unions advocate – most LMIs achieve a great deal of overlap in their roles and the ensuing activities undertaken to achieve their different missions and serve clients.

The strength of relationships between intermediaries and their clients greatly affect the activities LMIs are able to carry out, for whom, and to what extent (Benner, Leete et al. 2007). Strong relationships with workers allow for greater training opportunity, tracking of worker career trajectories, and advocacy of worker needs. Community colleges are an LMI that have traditionally been focused on serving and training students, and as such may fit into this category. Strong relationships with employers may enhance the number of employment opportunities made available to workers, foster greater knowledge of industry needs, and lead to greater employer outreach. Temporary staffing firms often work closely with employers to deliver workers to fit their needs, and as such have been more associated with this relationship. Unions have tended to have a strong relationship with both employers and employees, although in defense of workers they have been seen as putting the benefits of one over the other, creating antagonistic relationships (Benner, Leete et al 2007). Unions also suffer from providing less open access to workers than other intermediaries. Still, the strong-strong relationship of unions is desirable insomuch as they help to quickly deliver new training catering to employers with the goal of enhancing benefits accruing to workers.

The benefits of LMI third party organizations to labor market participants are enhanced by the shift to the “new” economy, characterized by the importance of information and greater flexibility in dynamic workplaces. Many older patterns of labor markets have changed to become more flexible, with increases in employer reliance on outside organizations for labor, weaker career ladders within organizations, reduced tenure in positions, and reduced benefits from tenure with employers (Kazis 1998). LMIs, as third party organizations suited to accumulate

information from both workers and employers, have seen a heightened role in ensuring a smoother transition in the labor market, which is more volatile today than ever before.

The range of organizations that attempt to undertake this agenda are as wide as the labor market it serves, ranging from the noted temporary staffing firms and institutions of higher education to community based organizations and professional headhunters (Laufer and Winship 2004). These intermediaries acquire the same strengths as intermediaries in other markets related to information acquisition and the accompanying economies of scale. In addition to the reduced cost of information, LMIs may also reduce the cost of error for employers; the most obvious example of this reduced cost are temporary workers who are employed through temporary staffing agencies, affording employers the ability to eliminate workers who are not up to the level of quality desired rather than enter into longer term employment contracts that may continue regardless of productivity. These benefits are closely related to the activity of matching or “placement”, as mentioned earlier.

Training, another activity of LMIs, is more closely related to market “molding”. Market “molding”, like matching, takes available jobs as given, but enhances prospects of workers or firms over a longer term (Benner, Leete et al. 2007). This change is performed by boosting the quality of workers through training, increasing the potential value to employers, and thus future wage rates for workers through greater or steadier wages and increased productivity accruing to regional industry. As Giloth explains, there are some basic characteristics that are shared between workers who are able to escape lower wages. Tenure at larger firms, access to higher quality employers, strategic job switching for those with higher education credentials, the attainment of higher educational credentials in general, higher cognitive skills in reading and

writing, and starting out within certain industries or occupations are all indicative of greater socio-economic mobility (Gilothe 2004).

The idea of market making is the final form of shaping labor “flows” mentioned by Benner et al and these activities are aimed at changing the actual character of the job through incumbent worker training, acting as the legal employer, and certain forms of advocacy (Benner, Leete et al 2007). This paper will focus more greatly on the market meeting and market molding activities, particularly placement and career services activities. The chart below is a reprint of a chart in a paper written by Benner et al. outlining LMI activities, and specifically focuses on market meeting and molding activities. It will be used as a guide for the analysis of the LMI that is the focus of this paper, community colleges.

Table 1: Summary of Assessment of LMI Landscape in Terms of Placement and Career Mobility Services

	Ideal Best Practices	Private Sector	Membership-Based	Public Programs	Non-Profit/CBO	Community/Technical Colleges
<i>Placement Activities</i>						
Outreach	Strong to both low and middle levels of labor market	Good	Narrow but deep	Limited to eligible population	Limited to eligible population	Minimal
Assessment	Deep knowledge of both technical skills and cultural factors of both workers/employers	Strong on employer side, weak on worker side	Strong	Minimal	Minimal on employer side: stronger, but still limited on worker side	Some and improving on employer integration; passive career advice on worker side
Training	Strongly linked with demand	Minimal	Strong in focused areas	Basic	Basic	Extensive
On-the-Job Assistance	Regular and extensive	Minimal	Mentorships important	Minimal	Minimal	Minimal
Support Services	Readily accessible and extensive	None	Minimal	Lots, but problems with access	Networked to County services	Minimal
<i>Career Activities</i>						
Intimate Industry Knowledge	Detailed knowledge of occupational progressions	Short-term focus, limited	Strong	Minimal, and limited to eligible populations	Minimal, and limited to eligible populations	Growing stronger
Building Worker Networks	Strengthening and expanding existing networks	Limited	Strong in narrow occupations	Minimal	Minimal	Minimal
Advanced/Lifelong Training	Detailed advanced technical training	None	Strong in narrow occupations	Minimal	Minimal	Extensive

Figure 1: Reprint of LMI Activities Table from “Staircases and Ladders” (Source: Benner et al 2001)

Community Colleges

Community colleges are broad organizations covering a wide variety of social needs within communities. While the scope of community colleges vary, many of these schools offer credit and non-credit courses, and are primarily public commuter schools that offer two year degrees. Community colleges serve a diverse student population, directly based on the values these institutions share of “open access, comprehensiveness of course and program offerings, and community building” within communities as cultural and intellectual hubs (Vaughan and American Association of Community Colleges. 2006). Community colleges have been cited as learning institutions focused on “comprehensive learning opportunities” which affords students the ability to take on employment with a two year degree, but also remain committed to the continued transfer of students into four year institutions where bachelor degrees can be ascertained. The current roles of community colleges have expanded in the past forty years to include basic and applied research, contract training, technical assistance, and conduct mid-career education (Bailey and Averianova 2001).

These new missions have created a great deal of conflict within these institutions and have forced some to choose sides between education and vocation. Other schools have taken on a hybrid model which allows for a dual-mission (Bailey and Averianova 2001). Schools that take on this hybrid model make resource allocation decisions based on the ability of that resource to benefit both the educational and vocational mission. While this paper attempts to avoid focusing on the institution itself, analysis of basic intermediary functions and activities should help to designate areas where efficiency in the role of LMI can be enhanced, aiding both resource allocation decisions and the vocational mission of community colleges.

Community colleges are uniquely well suited to serve disadvantaged workers pursuing continuing education because of their affordability, flexibility, and convenience. Part time enrollment growth in community colleges alludes to these benefits, with “non-traditional” class hours at these institutions appealing to the more “career-minded” student body. Part time students were the majority of enrollments in 2007 according to the AACC, at 59 percent of the total country wide student body. The average age of the student body was also older than that of traditional four year institutions, at 28 years of age. Over 50 percent of the student body was over the age of 22, with more than 1/6th of students over the age of 40. Employment status of community college students also help shed light on the rate of students that juggle work and education priorities. Twenty one percent of full time and 40 percent of part time students at community colleges worked full time and almost 60 percent of full time students worked part time (AACC 2010). These numbers are achievable because of the flexibility of the programs offered at community colleges.

Past research indicates that the ability for LMIs to enhance skill sets of employees while they are unemployed or even during employment are positive, speaking directly to the strength of community colleges. For instance, successful welfare to work programs have made “use of education and training in support of clear employment goals”, with the eventual outcome of higher wages and longer lasting employment opportunities (Giloith 2004). In one such study undertaken by Bos et al, the increases in welfare programs that incorporated job training after basic skills training and GED completion were 47.3 percent higher than the acquisition of both of these credentials and skills on their own (Huston, Duncan et al. 2001).

In the constant economic development argument back and forth on whether place based or people based strategies deliver better results (Fainstein and Markusen 1993), community colleges

offer a compromise: the place based institution that provides people-based economic development strategies through accumulations of human capital and enhanced relationships with local employers.

Role of Community Colleges in Regional Labor Markets

Giloth notes that the most underutilized resource as it regards existing LMIs are community colleges and technical schools, of which there are over 1,000 in the United States. Community colleges are pivotal within these vast networks working at a nexus between a variety of the stakeholders that foster, develop, and utilize human capital (Giloth 2004). Giloth is not alone in his recognition of community colleges as underutilized LMIs. Benner et al note that both community colleges and member based organizations are well suited to undertake initiatives that are successful at enabling key features of strong *career oriented* LMIs. These included targeting particular occupations or industry sectors, maintaining communication with workers over time, building relationships with employers, focusing on workers long term needs, and providing formal training and informal on the job learning (Benner, Brownstein et al. 2001). Other studies on LMIs have both included community colleges within their analyses and focused on them more specifically have noted some of the activities and outcomes that have taken place at community colleges historically.

Table 1: Selected Studies Analyzing Community Colleges as Labor Market Intermediaries

Author	Unit of Analysis	Community College LMI Activities (Current)	Analytic Methods	Findings
Benner et al 2007	Labor Market Intermediaries in Two Regions*	Placement Activities (Outreach, Assessment, Training); Career Activities (Intimate Industry Knowledge, Building Worker Networks, Advanced/Lifelong Learning)	Quantitative and Qualitative Data Gathering; Interviews; Empirical Analysis of labor market volatility; Multivariate Regression	Community Colleges often enroll savvy workers; allow for greater mobility through career related training
Kazis 1998	Labor Market Intermediaries; One Community College as the LMI; Two Community Colleges as partners of other LMIs*	Provide Training/Teaching; Partner with Support Services Intermediaries or Industry Consortia	Descriptive	Greater customized training available; utilization by CBOs; community college "lead actors" often non-credit depts; importance of staff priority
Laufer and Winship 2004 (ed. Giloth)	Labor Market Intermediaries in three industrial clusters in three cities*	Training, Risk Transfer	Interviews with Employers in Specific Industrial Clusters	Brand attributes of Community Colleges include: expected professionalism, training expertise, and benefits of location
Fitzgerald 2000	Three Community College Partnership/Outreach Programs	Sector targeting	Interviews with Community College Administrators	Shifts in Regional Economies have led to shifts in response and types of LMIs
Dougherty and Bakia 2000	Five Industries across states, twenty community colleges	Workforce Training; Small Business Assistance; Retention/Expansion/Recruitment of Business Activities	Descriptive Analyses, Observation, Interviews	Possible outreach benefits through Small Business Assistance; Enhanced participation in Local Economic Development Planning enhances visibility
Grubb et al 1997	Seven Community Colleges	Workforce Development; Flexible Scheduling, Contract Education, Collaboration with Employers, Economic "Environmental Scanning", Attracting Employers to Region, Collaboration with K-12 institutions	Descriptive, Empirical Analysis	New Types of Students, Greater Community Visibility, Limited Resources for Missions

*These studies included community colleges as one of many LMIs analyzed

Sources: Various Publications, Citations included in references

With respect to the actual undertaking and success of labor market activities, community college departments within the institution are often tasked with performing LMI roles as they are sources of knowledge for specific careers paths related to industries and occupations. While some studies have implicitly recognized academic departments as having relationships with firms (Mansfield 1995), the relative novelty of community colleges as labor market intermediaries leaves departmental roles to be explained in greater detail. In the same sense that firms are representative of local industry as a whole and are the functional instruments that carry out communications with other institutions in labor markets, academic departments are functional instruments where working relationships with external hiring organizations in related career fields can be achieved. Developing linkages between the departments and firms is essential

because these two types of institutions (or sub-institutions) share knowledge of industry and occupations that may not exist at the administrative level of higher education institutions.

Community College Activities Enhancing Labor Market Responsiveness

Building on the idea that job placement within desired career fields is a key goal for successful LMIs, and that this is done by enhancing skills through activities ranging from technical training to credentialing, certain activities incorporated by community colleges may be more inclined to create job readiness for local industry than others.

Below I have attempted to move beyond conceptual placement and career activities outlined by Benner et al, by outlining functional organizational activities that have been noted in the literature as effectively delivering the more abstract intended outcomes of the conceptual activities. Using these functional activities as a guide, I have further delineated some of the specific activities in use at community colleges today as variables potentially benefiting placement rates. Some of the variables overlap the broader conceptual activities and have been noted as corresponding to more than one concept (i.e. internships may be used as a tool for training workers, but can also be considered a method for assessing the quality of workers and even of the program of study). The applied activities included within this table are discussed in further detail.

Table 2: Operationalization of Community College LMI Activities and Corresponding Variables

Conceptual Activity(ies)	Community College LMI Activities for Operationalization	Corresponding Variable Analyzed
Training	Providing Experiential Learning Opportunity (i.e. Project-Based Teaching, Practicum, Field Study); On the Job Training; Cooperative Education & Internships	Project Based Coursework, Internship Requirement/Availability
Outreach	Marketing Skills of Workers to Employers, Marketing Employment Opportunity to Workers (i.e. flyer, etc), Expansion of Marketing Base	Industry Advisory Council, Internship Requirement/Availability
Assessment	Enhancement of Relationships with Participants, Longer Term Career Based Training, Partnerships with and Input from Employers, Use of Tools for connecting participants based on "fit"	Specialized Accreditation, Internship Requirement/Availability, Industry Advisory Council
Industry/Career Knowledge	Gathering detailed information on career progression; Anticipating Industry/Occupation Shifts; Maintaining of long term relationships with worker-clients	Industry Advisory Council, Specialized Accreditation
Network Building	Creating situations where workers can bond; Enhancing access to professionals in the career field	Internship Requirement/Availability

Source: Author Compilation based on LMI Activities Provided by Benner, Leete et al, 2007

Project based coursework is an example of “training”, enhancing the skill set of the individual to be better suited for industry or occupation specific employment. Experiential learning is “learning that combines experience, perception, cognition, and behavior” and depending on the form, may use research and laboratory methods informing an integrated process of data collection and observation. Once reflection takes place on the part of the individual, observations are then “theorized by the student and create implications for future action, which in turn “serve as a guide” for future experience (Kolb 1984). In terms of benefits to employers, experiential learning allows to students to engage in similar processes to work tasks and be prepared for critical problem solving that often come from work experience on the job. Project based learning is divided into five parts: (1) projects involve the solution of a problem; (2) they involve initiative by the student or group of students; (3) that results in an end product; (4) work goes on

for an extended period of time; and (5) teaching staff are involved in an advisory role (Adderley 1975).

More abstract laboratory “projects” may also extend to supervised practice, such as nursing and teaching. Supervised practical experience has been noted as an effective indicator of “appropriate practice” in teaching early childhood education, for one (Snider and Fu 1990). Ten models of practical experience (four of which were more closely aligned with on-site worker experience with an employing firm such as an internship) were recently analyzed in nursing education based on the increasing use of practice based teaching methodologies because of assumed effectiveness (Budgen and Gamroth 2008). Because most research on project based learning has been designed for specific occupational fields, it is difficult to specifically identify all the benefits accruing to students in a variety of programs of study, but it is clear that hands on practice is on the rise due to the belief that “real-life” experience is beneficial for workers engaging careers.

Cooperative education and internship are forms of “on the job” learning that are also experiential in nature, but allow students to interact within career environments, and are another intermediary activity. In this capacity, internships also serve as methods for increasing outreach to employers on their services, allowing for assessment through coordination of student activities on the job, and creating a larger network for students to engage in within career fields. In one study on undergraduate business internships analyzing the effects on career success, it was found that students who have spent time as interns were likely to spend less time obtaining their first position, see higher rates of monetary compensation, and saw a greater overall job satisfaction (Gault, Redington et al. 2000). The authors also noted that hiring organizations were more comfortable with interns and felt that internship programs with universities were likely to allow for maintaining a campus presence during economic downturns (Gault, Redington et al. 2000).

These benefits suggest that the assessment, outreach, and network building effects of internships do exist.

Relationship building with industry through industrial advisory councils or committees is a third example of an intermediary activity utilized by community colleges. While benefits of networks where industry engagement has been fostered by the institution itself have been explored (Fitzgerald 1998), there is less that has been written about relationships built at the department level to connect to industry through industry advisory councils. Barrows and Bosselman describe the roles of these councils with regards to education in hospitality management: “An advisory council consists of stakeholders who are willing and able to assume leadership in the development of complete educational experiences for students...Members of an advisory council must be able to think strategically when planning...strong commitment to establishing and extending linkages among schools, industry, government, and nonprofit organizations should become a priority” (Barrows and Bosselman 1999). Benner et al. note that partnerships with industry, including industry knowledge and corresponding input into curriculum, has been one of the ubiquitous factors in successful community college training programs (Benner, Brownstein et al. 2001). Industry councils also serve as opportunities for marketing the training performed at learning institutions and with time work to enhance trust of quality of both the institutions and the workers themselves that are supplied by the intermediary. The creation of industry councils by community colleges produce long lasting relationships with employer organizations, bettering understanding of local industry demand and community colleges’ ability to supply labor at a desired standard.

The final activity explained here is specialized accreditation. Specialized accreditation inculcates occupational needs into curriculum thereby enhancing community colleges understanding of

career progression and industry and occupational knowledge. The Accreditation Board of Engineering and Technology (ABET) describes their accreditation as an “assurance that a college or university program meets the quality standards established by the profession for which it prepares its students” acting as a market signal for employers (ABET 2010). Beyond enhancing career knowledge, this also suggests specialized accreditation is a method for assessing fit of workers with employers, at least based on acquired occupational skills. Organizations that bestow accreditation credentials on programs or departments look to understand the services or activities in the profession and their alignment with existing education, with a thoughtful understanding of the “past, present and the future” (Batalden, Leach et al. 2002). A survey of deans and program directors of allied health programs confirmed a view of the role of accreditation as a quality indicator for higher education, at least in regards to clinical laboratory sciences, with special note given to the importance of evaluation by a peer group rather than state measures for accountability (Baker, Morrone et al. 2004).

Analyses within this paper will assume that the optimal outcome as a labor market intermediary is placement in a position in the program related career field that labor market participants graduated from. This assumption is based on the two critical mistakes noted by Giloth et al that LMIs make: (1) encouragement of people to take “any job” rather than those that are within a career path; and (2) the provision of technical training that does not carry credit and therefore articulate towards some level of certification. Where labor market participants take up employment within career fields, and come back for continued education, further training builds upon existing skills and enhances knowledge relating to the career path (Giloth 2004). While goals of certain LMI’s may be focused on monetary benefit of the organization or its membership as a whole, the labor market activities of community colleges mentioned here are

more focused on providing individuals with increased human capital accumulation and promoting continued education, accruing to hiring organizations, workers, and the region.

Community College Role in Cluster Development

As a labor market institution, community colleges should be strongly cognizant of the regional economic development strategy, its effects on the regional labor market and their role within it. Rosenfeld, in an attempt to understand the role and effectiveness of two year colleges in the United States, Ireland, and Denmark that had focused cluster alignment strategies, found that cluster alignment by community colleges is beneficial for aiding human capital development of students. Cluster alignment is able to enhance human capital gained through more basic educational avenues because workers can learn in a “real life context for learning that is likely to be relevant...it encourages informal learning and skills that are not easily codified...Third, news of jobs or economic opportunities spreads quickly to students through faculty or social grapevines” (Rosenfeld 2000). Institutional reflection on curricula and programs to train workers in fields that are aligned with local industry are the core of stronger market responsive tendencies and reinforce the benefits of education to students with skill creation inside and outside of the classroom. Local industries gain from heightened labor productivity and lower training costs (Rosenfeld 2000).

Additionally, as Giloth et al note, one of the clear policy implications of the characteristics of employees that show mobility in the workplace is selectiveness in the choice of “employers in job placement and skill upgrading efforts” (Giloth 2004). Sectoral strategies for enhancing intermediary success has recently been promoted by a number of studies as a means for enhancing a dual customer approach for workers and employers, creating more tailored training for regional industries needs, and promoting lasting change in regional labor markets (Griffen

2008 & Conway et al 2007). In short, LMIs and community colleges in particular, should attempt to have some focus on industries or occupations that will lead to beneficial outcomes for workers (or students), in terms of wage growth and job security, with the additional benefit of promoting local industry competitiveness.

New York City Clusters and Targeted Industry

The level of market responsiveness shown by community colleges is especially dependent on the current and emerging economic clusters in the city. According to the New York City Economic Development Corporation, industries New York focuses on promoting include “Arts, Not for Profit, and Higher Education”, Bioscience, Fashion, Financial Services, Green Industry, Manufacturing and Distribution, and Media and Emerging Technology (NYCEDC 2010). Industries identified by the city are important for understanding possible market responsiveness due to the existence of government resources promoting their growth, as well as identification of potential areas of economic focus in the future, which are more difficult to identify through traditional cluster analysis.

New York City Community Colleges

New York is home to the largest urban public university system in the country, the City University of New York (CUNY). CUNY has twenty six schools in its system, six of which are two year community colleges: Borough of Manhattan Community College (BMCC), Queens Community College (QCC), Hostos Community College (Hostos), LaGuardia Community College (LGA), Bronx Community College (BCC), and Kingsborough Community College (KCC). Two of the community colleges are located in Queens and the Bronx, and one of each is located in Manhattan and Brooklyn. As a comprehensive system, CUNY extends to over 1,700 programs, 230 majors leading to degrees, and maintains over 6,700 full time faculty members

(CUNY 2010). All six community colleges were established between 1957 and 1969, during a national push to advance educational attainment. CUNY community colleges maintain a commitment to the liberal arts and sciences in order to serve a transfer role as feeder institutions to four year institutions. The six community colleges made up 58,520 of the 178,175 total full time equivalent students in the CUNY system in 2008, and have seen steady growth during the past five years (OIRA 2010a).

Chapter 3: Research Design

Hypothesis

As labor market intermediaries, community colleges can help to reduce uncertainty for firms and other hiring organizations by understanding and engaging local and regional industry, thereby creating more effective market signals through credentialed students. Simultaneously, they can enhance the quality of the labor supply by increasing students' human capital through educational gains and increased knowledge of their career fields.

This paper will assume that academic departments serve as functional instruments of community colleges and have a major role in increasing the availability of information to producers and consumers of labor, thereby reducing labor market gaps between demand and supply. I

hypothesize that those academic programs of study offered by academic departments that (1) align with local industry and occupational strengths; and (2) undertake a variety of labor market activities for enhancing students' knowledge of career fields and employers' information on the available labor supply, will see a higher rate of job placement within career fields. Higher employment placement rates act as a measurement for their ability to reduce gaps between labor producers and consumers. Other tangential questions are also examined in this research.

Empirical questions to this effect include (1) do students in programs that are more responsive see greater labor attachment in general; (2) are student transfer rates greatly affected when programs are more responsive and; (3) are certain tools of responsiveness more effective than others in reducing labor market gaps?

Concepts

There are two concepts in particular that need elaboration for the purpose of understanding the goal of the research. Clustering has three dimensions of measurement: geography, linkage and

time. Geography is the most pertinent dimension of measurement for this paper. In addition, clusters can be defined by different measurement units, such as firms, employments, patent types, etc. In order to assess the existence of clusters in the specified geographic area toward the goals of this research, clustering will be defined as high concentrations of employment by industry sector and occupation within the specified geographic area. Measuring the existence of these concentrations will be done through location quotient and local competitiveness calculations, which are more precisely laid out in the analysis section.

The second concept integral for understanding the goals of this research is the “responsivity” of academic department programs. Responsivity is simply a term for encompassing efforts that improve job placement of students within the program of study by developing the skill sets of students geared towards local employers needs and enhancing the quality of student education and related credentials for employer use. This concept builds on the microeconomic terms used in the literature review touching on the necessity of perfect information for truly competitive markets, the difficulty in making that type of information available in labor markets due to the existence of asymmetric information, and the ability for enhanced educational credentials to serve as mechanisms for increasing familiarity with and assuring quality of labor ability. This effort reduces concerns over quality uncertainty, thereby increasing the efficiency of regional labor markets. Activities increasing responsivity, as bounded in this paper, are attempts to match employers and workers based on existing needs and skills through industry dialogue and occupational focused curriculum as well as molding worker skills through project based training and on the job training, the latter of which serves to give employers a chance to assess workers before hiring.

Units of Analysis

The main unit of analysis for this paper is the academic program of study towards degree completion. Aggregation of individual job placement data will be summarized as an output representing job placement results at the program of study level. Subsets of programs may also be used to identify effects of certain types of LMI activities. Responsivity analysis will be performed at the program of study level, although department level information may be used to extrapolate downward.

The second unit of analysis will be the institution itself. While this paper does not focus on changes undertaken at the institutional level, broader information regarding demographics of the student population are only available at this level. This demographic information will be used to aid assumptions on similarities of the student population as it relates to possible competing independent variables, such as income, race, and program resources.

The region is the third unit of analysis for this study. Regional economic analysis will allow for a thorough understanding of existing industrial and occupational strengths and weaknesses and potential areas of employment growth and decline. This analysis will inform the expected effects of the structure of the local economy as projected onto the job placement outcomes at the program of study level.

Variables

The dependent variable for this paper is the job placement outcomes of students that have received an associate's degree within specific programs of study in a position related to that field of study, which acts as an indicator for human capital accumulation at the individual level and a quality marker for hiring organizations. More specifically, students that report themselves as "employed, training-related" or "employed, slightly training related" within six months of

graduation for each program of study analyzed will define whether or not desired outcomes of student training have been achieved.

To this point we have broadly labeled two independent variables: industry and occupation clustering within regions and responsiveness of programs of study. Clustering will be defined simply for this paper, with elements of employment concentration and projected employment resilience in specific, related industries and occupations within the region defining a cluster. Industries and occupations that align with certain programs of study will be identified with how they may stand to gain, or not, from agglomerations of industry and occupation, and will be analyzed to see how these alignments affect the dependent variable.

The second aggregate independent variable is the variation in responsiveness of programs of study based on labor market activities, as defined in the concepts section. Variability of responsiveness will be estimated through the four operationalized variables noted in the literature review representing placement and career activities. Where applicable, these four variables are also analyzed as their own set of independent variables for this study: internship participation, project-based experiential learning opportunities, program accreditation, and departmental industry advisement. Rankings attributed to each variable and their contribution to the aggregate ranking of the LMI activities are defined in further detail in the analysis section of this paper.

Other independent variables that are not the direct subject of this study are also included to allow for alternate explanations of effects on the dependent variable. Demographic makeup of student populations, available at the institutional level, is used to identify whether or not certain socio-economic factors may offer explanations for job placement rates. In addition, while department financial information is unavailable for CUNY schools, student satisfaction with faculty and institutional dollars per student are used to glean an understanding of whether resources available

to students may impact the dependent variable. Finally, social capital is addressed through a look at job referrals of students in each aggregate program of study.

Research Strategy

The research strategy used for this project will be a comparative case study of twenty four academic programs in total. Case studies are composed of five academic programs (i.e. nursing, accounting, etc), that exist in at least four different community colleges. Each program was assessed to allocate a ranking based on their varying levels of responsivity established by the labor market intermediary activities noted earlier. Prior to calculating these rankings, anticipated job placement outcomes of programs of study will be adjusted to fit into relative levels of alignment with regional clusters and areas of the economy that are “non-clustered”.

Cluster Analysis

One of the key measurements for assessing the concentration of employment within an industry or occupation is location quotients. Location quotients are measures of regional industries as a portion of the entire regional economy in comparison to that industry’s proportion to a larger base economy. The use of individual employment works particularly well for this study because both industry and occupational employment are measured as aggregations of individuals. In this case, the New York City Metropolitan area will be the regional economy assessed, with the entire economy of the U.S. serving as the base. These calculations will be done for two years, a base year and the recent year, 2005 and 2009, respectively. The formulae for these equations are as follows:

Regional Employment in Industry A: R_a
Total Regional Industry Employment: L_t
National Employment in Industry A: NE_a
Total National Industry Employment: N_t

Industry Location Quotient: $(La/Lt) / (NEa/Nt)$

Regional Occupational Employment in Occupation A: O_{Ea}

Total Regional Occupational Employment: O_{Et}

National Occupational Employment in Industry: NEa

Total Occupational Employment: NEt

Occupational Location Quotient: $(O_{Ea}/O_{Et}) / (NEa/NEt)$

Location quotients of greater than 1.15 in industries and occupational areas by employment will be considered as signals for geographically clustered economies. As a second indicator of clustering, a shift share analysis will be used to complement location quotient analysis in identifying clusters. Shift share analysis is more complex in its application, allowing for deeper analysis through its ability to recognize growth, stability, or decline in the regional economy and the national, sectoral, and regional factor contributions to these changes. This analysis calculates the national share of the rate of change, industry share of the rate of change, and local or regional share of the rate of change, which are modeled to calculate a competitiveness differential based on regional industry and occupation strengths.

National Total Employed – Recent Year: N_{Tr}

National Total Employed – Base Year: N_{Tb}

Regional Total Employed – Recent Year: R_{Tr}

Regional Total Employed – Base Year: R_{Tb}

National Industry Employed – Recent Year: N_{Ir}

National Industry Employed – Base Year: N_{Ib}

Regional Industry Employed – Recent Year: R_{Ir}

Regional Industry Employed – Base Year: R_{Ib}

National Average Growth Rate (NAGR): $[N_{Tr}/N_{Tb}] - 1$

Industry National Growth Component (INGC): $R_{Ib} * NAGR$

Industry National Growth Rate (INGR): $[N_{Ir}/N_{Ib}] - 1$

Industry Mix Differential (IMD): $INGR - NAGR$

Industry Mix Employment Change (IMEC): $IMD * R_{Ib}$

Industry Local Growth Rate (ILGR): $[R_{Ir}/R_{Ib}] - 1$

Competitiveness Differential (CompDif): $ILGR - INGR$

Competitiveness Employment Change (CEC): $\text{CompDif} * \text{RIb}$

The CEC is a calculation of the change in employment that can be attributed to the competitiveness of the region. After assessing the strength and growth of industry and occupations through location quotients and shift-share analysis, available academic programs will be split into those that are aligned with regional clusters and non-clustered industrial occupations. Industrial-occupations are the outgrowth of triangulation of both industries and occupations that share clustered or non-clustered characteristics. For instance, if accountants (by occupation) and offices of accounting (an industry that is the largest employer of accountants), are both over 1.15 for the New York Metropolitan region, a geographic cluster can be assumed that presents an opportunity for students in Accounting programs of study. This slotting by cluster will help inform the larger regional labor market dynamics affecting the job prospects of students.

Academic Program Analysis

The second “layer” used to examine and differentiate between programs are the activities they undertake as LMIs, as outlined earlier. Variability in the total level of activity engagement of each program is based on the level at which they undertake the four activities. For the exploratory context of this paper, each activity will be assessed on a five tier scale from “low” to “high”, and then aggregate rankings will be compiled and adjusted for qualitative features labeled below. Rankings will then be distributed into five groups of aggregate responsiveness: low, low-medium, medium, medium-high, and high. College catalogs from 2005 were used to assess activities that existed beginning from the base year of study, the 2005-2006 school year.

Project based learning will be the first LMI activity assessed. Students’ engagement in projects or laboratory work that acclimates them to technologies in the career field environment,

including team-roles, computer technology, and current methods for problem solving will be considered as contributing to a higher variation ranking. Courses that include process based feedback, relearning of earlier concepts, holistic processes of adaptation, transactions between individuals and their environment, and learning beyond a “transmission” model will also fit into the definition of project based learning (Adderley 1975). Course curriculum will be used to document the existence and variability of hands on emphasis for these classes, with programs receiving rankings ranging from low to high. Coursework that is conducted in applied environments but are designed to reinforce traditional classroom curriculum will have lower rankings while courses that identify specific clients, product, or process outcomes in their scope of work in an applied fashion will have higher rankings. The purpose of this differentiation is to assess the stated goal of advancing the students understanding of industry-occupation focused skills, rather than more basic but rigorous knowledge of academic curriculum.

These second of the four activities is internships and co-operative education. This activity is designed to benefit students by introducing them to networks of professional and practical experience in their field of study while allowing employers to have greater information on student ability within the career field. Programs that do not require *and* do not explicitly offer internships to students are considered to have the lowest internship ranking: “low”; training experience within the field of study explicitly required by the curriculum results in a ranking of “high”. While there may be concern over the dilution of training experience if it is required, the assumption is that the larger the total percent of the program’s population that has received training experience, the greater the facilitated relationships between local labor supply and demand will be, enhancing the total percentage of those students that see favorable employment

outcomes. In cases where internships are formally offered, but not required, a ranking of medium will be given.

The final two factors are more closely related to increasing industry and career knowledge and enhancing assessment relationships with employers. Industrial advisory councils (or committees, teams, etc) that provide guidance on current trends within industry and related occupations are the third activity analyzed. These councils should enhance departments' ability to understand local demand by increasing the level of industry engagement they undertake, facilitating ongoing discussions between community colleges and employers, and fueling comprehension of local industry trends and needs.

There are three types of industrial advisory councils used for this paper that allow for a ranking between low and high: no council whatsoever, program-focused councils, and department-wide councils. Departments and programs where no councils exists whatsoever will receive a "low" ranking. Industrial councils specifically advising programs of study will receive a ranking of "high" where the council is made up entirely of outside professionals within local industry related to the course of study, as opposed to a council of academic members. In cases where industrial councils are mixed between professionals and academics, there will be variation between low and high based on the percentage of council members that are professionals within related industries. Department wide councils are considered less closely aligned with specific program related professional needs, necessitating some level of differentiation from program focused councils. Where a department council advises a department with multiple programs of study, the value given will be based on the analyzed program of study and the professional members background in relevant industry. Variation may also be reduced where curriculum for programs of study are spread across a number of departments.

The final factor included in this aggregation is accreditation standards. Accreditation comes in two forms, institutional and specialized. As the focus of this paper is on specific programs of study and accreditation benefits as it regards industry and career focused strategies, “high” rankings given for this factor will only be given for programs of study that qualify as receiving specialized accreditation. Accreditation allows employers to have an additional market signaling device in recognizing the quality of graduates that go through certain programs of study, which are partially standardized to ensure graduate knowledge within the career field. In addition, accreditation is also used by licensure and certification boards as a screening measure for applicants, enhancing the professional legitimacy of students who attend accredited programs. Community college departments gain from a critical assessment of their programs of study and receive feedback on shifts in occupational needs and changes to career progressions. Programs of study that have been accredited will receive a high ranking whereas programs of study that have not received accreditation will receive a low ranking. Departments with specialized accreditation will also receive “medium” credit in this category. Accredited departments that encompass many programs will be adjusted to reduce the variation ranking due to a reduction of curricular focus related to occupations from the accrediting organization.

Case Study Analysis Plan

Once the levels of clustering and responsivity have been calculated, programs of study can be fit into the comparative case study format. The table below outlines the stratum for program slotting based on the two dominant factors studied in this analysis: clustering and aggregate level of responsivity.

		Clustered Industry-Occupation in Region	
		NO	YES
Level Of Responsivity	HIGH		
	LOW		

Figure 2: Case Study Analysis Format

Cases will be slotted into each of these quadrants, with each program of study fitting into clustered or non-clustered industry-occupations and high or low levels of responsivity variability. Job placement rates of each program of study will be assessed to see if higher percentages correspond to clustered occupations and industries as well as higher levels of responsivity. Conversely lower rates of job placement will be analyzed to see if they are aligned with non-clustered industries and occupations as well as lower levels of responsivity. Competing independent variables will then be used to understand whether correspondence, if found, can be evidenced through the two independent variables hypothesized to have a relationship with the dependent variable. In some cases, variables that make up the aggregate responsivity ranking will be analyzed on their own where these activities are deemed important to the relevant program of study and the eventual occupation or industry of job placement.

Data Sources

As it regards the calculation of both industrial and occupational clusters, data is available at the Metropolitan Statistical Area level through the Bureau of Labor Statistics (BLS). The first set of data available from the BLS is the Quarterly Census of Employment and Wages (QCEW) based on ES-202 records. QCEW collects information provided through state and federal unemployment insurance laws and makes employment, firm, and wage information available for industries at geographic levels where individual or firm privacy is not in jeopardy. Occupational

Employment Statistics (OES) are also made available through the BLS. OES is a semiannual survey of nonfarm establishments that sample from a list of establishments that are maintained by State Workforce Agencies, also for unemployment insurance purposes (BLS 2010).

Collecting information on levels of variability regarding responsivity will be done through the use of archived documents, including historical course catalogs from each institution, institutional and department newsletters, and existing department websites, which were made available through collegesource online (collegesource.org 2010). These documents are important for understanding how deeply embedded each of the four indicators for activities regarding responsivity is in each program of study. Archival records include information on the existence of internships/cooperative education/clinical opportunities within the curriculum, project based learning curriculum, department or program industry advisory boards, and in some cases accreditation of programs by professional organizations. Accreditation will also be confirmed using search databases of accredited programs made available from the accrediting organization, including the Association of Collegiate Business Schools and Programs, the National League for Nursing Accrediting Commission, and the Accreditation Board for Engineering and Technology. Finally, the linchpin for this study is the analysis of job placement outcomes. The CUNY Office of Institutional Research and Assessment sends out the “survey of graduates” to all graduating students six months after they have completed a program of study and received a degree. CUNY has graciously allowed access to these student level data with identifiers removed of all survey responses. Information on job placement, placement field, internship experience, professional examinations undertaken, income, and degree conferred are all included within the data.

There were 9,935 records from six community colleges and four comprehensive colleges in the data. This study was limited to the six community colleges for the purpose of reducing noise that

may be associated with better or worse placement and career services activities at four year schools that offered two year degrees. Over 25 percent of the records were for liberal arts related study programs, which have the more traditional focus of community colleges efforts at transferring to four year schools. Business administration, a rather broad degree field for eventual job placement, was the second largest sample, making up 1,532 students in the record set. Nursing was the third largest program with 1,030 records collected.

Validity

Due to the complex nature of labor markets and hiring processes, there are threats to validity for the research conducted. Efforts to minimize internal validity concerns are especially difficult to undertake due to the deep variety of factors that drive employee hiring processes and student performance. As mentioned in the section on limitations of this report, we will not attempt to directly address hiring issues related to race or student performance concerns regarding transportation, learning attitudes, institutional leadership, etc. By aggregating individuals within varying programs of study, it is assumed that some level of similarity between each program's student populations will emerge, allowing for comparable samples of students with a variety of educational, experiential, income and racial backgrounds. Demographics of student populations will be calculated at the institutional level and included to test this assumption.

External validity is aided by the collection of regional labor market information by the BLS through ES-202, available for all U.S. Metropolitan areas for analysis. Still, the sheer density of New York's metropolitan area and the availability of a variety of public services should be noted for future studies attempting to understand other regional labor markets through this method. Additionally, CUNY schools have very similar tuition rates by programs of study at different schools, which may not be the case for other regions that do not have an umbrella organization

coordinating tuition rates. While replicability of the method may be possible for future studies, generalizability may suffer from these differences.

Concluding Remarks

Assessing twenty four programs of study allows for some directional, and possibly magnitudinal correspondence between job placement rates and those programs that are aligned with local industry-occupation clusters and higher rates of activity utilization and related responsiveness, as characterized by the four factors noted earlier. Findings from the study will allow for deeper conversation on whether or not community colleges can increase information flow between local labor demand and supply through greater alignment of courses of study with regionally clustered industry-occupations and better alignment with industry needs through labor market responsiveness.

Chapter 4: Analysis and Results

Analysis

The first step in identifying programs for this project is availability. Availability speaks to the existence of at least four programs that attempt to advance students along similarly minded curriculums based on where programs share the Higher Education General Information Survey (HEGIS) code, which is a uniform code designed to provide comprehensive information on various aspects of postsecondary education (IAED n.d.). In most cases, programs also share the type of degree received, being an Associate in Applied Science (A.A.S), Associate of Science (A.S), or Associate of Arts (A.A), unless the use of a different degree program helps to make differences in the use of activities clear. Before identifying these programs, it should be noted that liberal arts and sciences and business administration were both excluded from this analysis because of the broad range of industry and occupational possibilities available for students, which reduce the more targeted labor market transactions that are the focal point of this paper.

Below is a list of programs with the institution names by HEGIS Code and basic description:

500200 - Accounting (all A.A.S): Borough of Manhattan Community College, Bronx Community College, Hostos Community College, Kingsborough Community College, LaGuardia Community College, and Queens Community College

510100 - Computer Information Systems /Microcomputers for Business/Computer Science: Borough of Manhattan Community College (A.S.), Bronx Community College (A.S), Hostos Community (A.A.S), Kingsborough Community College (A.A.S), and Queens Community College (A.A.S)

510300 - Computer Information Systems /Computer Science: Borough of Manhattan Community College (A.A.S), Kingsborough Community College (A.S), LaGuardia Community College (A.A.S)

520810 - Nursing (A.A.S): Borough of Manhattan Community College, Bronx Community College, Hostos Community College, Kingsborough Community College, LaGuardia Community College, and Queens Community College

560900 - Engineering Science (A.S): Borough of Manhattan Community College, Bronx Community College, Hostos Community College (Electrical, Chemical and Civil),

Kingsborough Community College, LaGuardia Community College (Civil and Electrical), and Queens Community College

550300 – Education Associate/Early Childhood Education/Child Development: Borough of Manhattan Community College (A.S), Bronx Community College (A.A.S), Hostos Community College (A.A.S), Kingsborough Community College (A.A.S), LaGuardia Community College (A.A)

Before going into the analysis of clusters related to each program of study, some forecasted relationships as represented by the labor market intermediary between programs of study and occupation and industry must be drawn. Many of the programs of study note positions that students may be qualified for after graduation. Each of the programs of study examined is below with possible occupational or industry related outcomes, as expressed by the community college catalogs:

Accounting: Bookkeepers, Cost Accounting Clerks, Junior Accountants, Tax Examiners & Preparation Specialists

Computer Related: Junior Computer Programmer, Computer Operator, Computer Support Specialist, Application User Specialist, Data Entry Operator, Web Page Designer, Desktop Publishing Specialist

Education Associate/Studies: Teaching Assistants, Childcare Assistant, Bilingual Assistant Teacher, Recreational Aid

Engineering Science: Engineering Technician, Drafters

Nursing: Registered Nurse, Licensed Practical Nurse, Clinical Specialties

These occupations and the industries that are most aligned with their employment help clarify the areas of industrial and occupational clustering noted in the following section.

Cluster Analysis of Program Related Industries and Occupations

The second portion of the analysis is the narrowing of programs of study into clustered and non-clustered industry-occupations. The first portion of the cluster analysis will be performed on industries in the New York Metropolitan Statistical Area (MSA). Industry classifications for this

analysis will be done through official categorization of industries used by the U.S. government called the North American Industry Classification System (NAICS). NAICS codes are split into a variety of two to six digit sector and industry categorizations, where two digits broadly include super-sectors of industries down to six digit industries that specify more narrowly defined industries within larger industry subsets (BLS n.d). For the sake of this paper, we will use four and five digit NAICS codes, which specify industries below the sector level, but are not as well defined as the six digit codes. Doing so allows for greater availability of data, which is often not available at the six digit level, while being more meaningful than sector data because of their specificity. Industry location quotients, recent employment growth, and competitive differentials in the New York metropolitan area that correspond to the programs of study availability for analysis are as follows.

Table 3: Programs of Study, Related Industry and Economic Cluster Indicators

Corresponding Program of Study	NAICS Code & Description	LQ05	LQ09	CEC	ILGR
Accounting	54121 Accounting, Tax Preparation, Bookkeeping and Payroll Services	1.49	1.55	1,648	8.1%
Accounting	5511 Management of Companies	N/A	1.27	N/A	N/A
Nursing	62211 General Medical and Surgical Hospitals	1.12	1.11	(11,494)	2.9%
Nursing	62311 Specialty (except Psychiatric and Substance Abuse) Hospitals	1.43	1.44	(922)	22.2%
Nursing	62161 Home Healthcare	1.59	1.72	5,625	32.1%
Computer Science/Computer Information Systems	5415 Computer Systems Design and Related Services	1.07	1.09	(454)	17.5%
Computer Science/Computer Information Systems	51121 Software Publishers	N/A	N/A	N/A	N/A
Education Associate/Early Childhood Educ.	6111 Elementary and Secondary Schools	N/A	1.70	N/A	N/A
Education Associate/Early Childhood Educ.	62441 Child Day Care Services	N/A	1.36	N/A	N/A
Engineering Science (Electrical)	33441 Semiconductor and other electronic component manufacturing	0.43	0.52	1,701	(2.0%)
Engineering Science	54171 – Research and Development in the physical, engineering, and life sciences	1.17	1.21	310	9.5%
Engineering Science	54132 Architecture and Landscape Architecture Services	N/A	1.05	N/A	N/A
Engineering Science	54138 Testing Laboratories	1.13	0.87	(2,696)	(24.0%)
Engineering Science	33451 Navig., Measuring, Electromedical, and control instruments manufacturing	0.65	0.60	(1,694)	(13.0%)

Source: Bureau of Labor Statistics, *Quarterly Census of Employment and Wages 2005-2009*

Occupational classifications for this analysis are delineated by official categorization of occupations used by the U.S. government called Standard Occupation Classifications (SOC) Codes. SOC codes are used by the government to categorize occupations in a form to collect and analyze data (BLS n.d.). Occupational location quotients, employment growth rate and competitive differentials in the New York metropolitan area that correspond to the programs of study in terms of availability are included in the table below.

Table 4: Programs of Study, Related Occupations and Economic Cluster Indicators

Corresponding Program of Study	SOC - Occupation Description	LQ 05	LQ 09	CEC	Emp. Growth (2005-2009)
Nursing	29-1111 Registered Nurses	1.10	0.96	(19,393)	(2.9%)
Nursing	31-1011 Home Health Aides	2.47	1.80	(38,326)	6.4%
Nursing	31-1012 Nursing Aides, Orderlies & Attendants	1.07	1.07	1,395	4.9%
Nursing	31-9092 Medical Assistants	0.89	0.74	4,064	10.3%
Nursing	31-9099 Healthcare Support Workers	1.21	1.18	(310)	0.2%
Accounting	43-3031 Bookkeeping, Accounting and Auditing Clerks	1.05	1.10	7,073	2.8%
Accounting	13-2011 Accountants and auditors	1.41	1.46	5,081	10.8%
Accounting	13-2082 Tax Preparers	0.96	N/A	N/A	N/A
Computer Info. Sys/Computer Science	15-1041 Computer Support Specialists	1.06	0.99	(1,956)	2.2%
Computer Info. Sys/Computer Science	15-1021 Computer Programmers	1.65	1.72	2,214	0.1%
Computer Info. Sys/Computer Science	15-1031 Computer Software Engineers, applications	1.10	1.25	5,152	25.2%
Computer Info. Sys/Computer Science	15-1071 Network and Computer System Administrators	1.19	0.99	(4,107)	4.9%
Engineering Science	17-3022 Civil Engineering Technicians	0.34	0.39	291	6.9%
Engineering Science	17-3023 Electrical & Electronic Engineering Technicians	0.68	0.67	(18)	(7.4%)
Engineering Science	17-3024 Electro-Mechanical Engineering Technicians	0.42	0.60	177	47.5%
Engineering Science	17-3029 Engineering Technicians, all other	0.26	0.35	421	21.1%
Engineering Science	17-3012 Electrical and Electronic Drafters	0.93	0.79	(239)	(12.6%)
Engineering Science	17-3013 Mechanical Drafters	0.71	0.66	(208)	(10.0%)
Engineering Science	17-3019 Drafters, all other	0.47	0.79	377	48.4%
Education Associate/Early Childhood Education	25-9041 Teacher Assistants	1.54	1.31	(17,235)	(13.0%)
Education Associate/Early Childhood Education	11-9031 Preschool Teachers, except Special Ed.	1.22	1.16	(852)	8.5%
Education Associate/Early Childhood Education	39-9011 Child Care Workers	1.64	1.61	(168)	6.5%

Source: Bureau of Labor Statistics, Occupational Employment Statistics, May 2005-2009

Using the national industry-occupation matrix as a projection for occupational industry

employment in New York, overlap between certain industries and occupations can be assessed.

This matrix serves as information to understand the distribution of employment in industries to recognize the potential for future prospects (BLS n.d.). Clusters existing in both occupations and

industries within the New York Metropolitan Area are most well suited to gain from academic programs catering to career fields that overlap both types of regional strengths. The chart below outlines the major occupational components of analyzed program related industries in the New York Metropolitan Area, according to national industry-occupational employment figures with the corresponding program of study.

Table 5. Proportion of Relevant Occupations in Selected Industries

Program of Study	Industry	Occupation	Occupation % of Industry Employment
Accounting	Accounting, Tax Preparation, Bookkeeping and Payroll	Accountants and Auditors	32.6%
Accounting	Accounting, Tax Preparation, Bookkeeping and Payroll	Bookkeeping, Acct., and Auditing Clerks	11.4%
Accounting	Accounting, Tax Preparation, Bookkeeping and Payroll	Tax Preparers	7.0%
Accounting	Management of Companies and Enterprises	Bookkeeping, Acct, and Auditing Clerks	4.2%
Nursing	Home Health Care Services	Home Health Aides	29.8%
Nursing	Home Health Care Services	Registered Nurses	13.8%
Nursing	Home Health Care Services	Lic. Practical Nurses	6.5%
Nursing	Hospitals, Public and Private	Registered Nurses	37.2%
Nursing	Hospitals, Public and Private	Nursing Aides, Orderlies, Attendants	27.7%
Nursing	Nursing Care Facilities	Lic. Practical Nurses	7.6%
Nursing	Nursing Care Facilities	Registered Nurses	12.9%
Nursing	Nursing Care Facilities	Nursing Aides, Orderlies, Attendants	7.7%
Computer Info. Sys/Computer Science	Computer Systems Design & Related	Computer Software Engineers, Applications	12.1%
Computer Info. Sys/Computer Science	Computer Systems Design & Related	Computer Programmers	7.8%
Computer Info. Sys/Computer Science	Computer Systems Design & Related	Computer Sys. Analysts	9.7%
Computer Info. Sys/Computer Science	Computer Systems Design & Related	Computer Software Engineers	8.7%
Computer Info. Sys/Computer Science	Computer Systems Design & Related	Comp. Support Specialist	6.9%
Computer Info. Sys/Computer Science	Software Publishers	Computer Support Specialists	7.2%
Computer Info. Sys/Computer Science	Software Publishers	Computer Programmers	6.9%
Engineering Science	Semiconductor and other electronic component mfg	Electrical and electronic eng technicians	4.1%
Engineering Science	Research and Development in the physical, eng, life sciences	Electrical/Mechanical Eng. Technicians	<3.0%
Engineering Science	Testing Laboratories	Engineering Tech.	7.4%
Engineering Science	Arch. & Landscp. Des. Services	Arch. & Civil Drafters	17.7%
Education Assoc/Studies	Child Day Care Services	Preschool teachers, except special ed.	34.6%
Education Assoc/Studies	Child Day Care Services	Teacher Assistants	13.5%
Education Assoc/Studies	Child Day Care Services	Child Care Workers	29.5%
Education Assoc/Studies	Education Services, Public and Private	Teacher Assistants	8.1%

Source: Bureau of Labor Statistics, National Employment Matrix 2008-2018 Projections

As an effort to display the value of a strategy that is based on aligning with local areas of industry strength and projected areas of growth, there must be some consideration of simple tools

available to savvy community college administrators, department chairpersons, or curriculum committees. The use of location quotients as static indicators of current strength have been noted, as have national proportional data of occupations within industries. Another set of tools are projections of industry growth, often available at the state or national level. Although detailed projections at the state level could not be ascertained, projections for more generalized occupations and industries were available through the Department of Labor's 2005 State Plan for the projected period between 2002 and 2012 (NYSDOL 2005). Retrospective analysis of employment outcomes are also utilized to provide context on how occupations and industries actually fared.

Hypothesized Outcomes Based on Cluster Analysis & LMI Activities

The following graphic is a quadrant designed to show program placement by the defined independent variables in the case study.

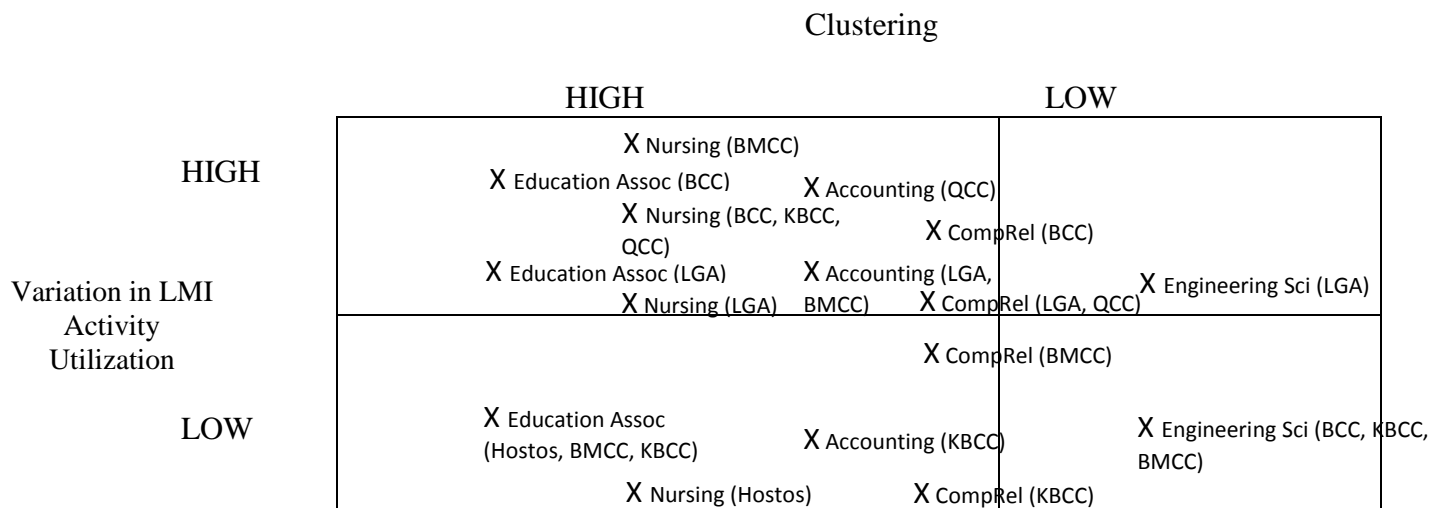


Figure 3: Visualization of Case Study in Quadrant Chart

According to historical clustering and projections of growth in occupations and industry related to accounting, accounting majors were expected to have a slightly above average rate of job placement as compared to total college employment placement for *students seeking or currently placed in full-time employment* (NYSDOL 2005). This qualification is to separate students that have entered community college with the eventual goal of transfer into a baccalaureate program. The average placement rate of *all* seeking or employed students into work was 83.1 percent, with 47.8 percent of students being placed in work related to their field of study.

Actual growth both in the Accounting, Tax Prep, Bookkeeping and Payroll Services industry and amongst bookkeepers and tax preparers had timid, but positive rate of growth during the period analyzed, in line with projections. The average placement rate of all seeking and employed students for accounting majors was 80.4 percent, with 51.9 percent of all accounting majors placed into positions related to their field of study.

Students in nursing programs were expected to see job placement rates above the student population average. Healthcare support and practitioner occupations were slated to see strong job growth as was the health services industry; although neither registered nurses nor general hospitals are clustered in the region (NYSDOL 2005). Interestingly, the actual number of registered nurses in the New York Metro area has declined during the 2005-2009 period by almost 4 percent. Offsetting this decline were industry growth for specialty hospitals and home healthcare, which are clustered industries that saw strong employment growth over the period. Other occupations where nursing program graduates may have found employment, such as home health aides and healthcare support, were both clustered occupations with nominal growth in the period between one and three percent. The actual placement rates for nurses were higher for

overall placement and far higher for related placements than the average, at 88.5 percent and 82.1 percent of nursing graduates finding work and related work, respectively.

Computer related program employment opportunities were expected to see a growth rate slightly above the student population average due to industry concentrations approximating the national average, some growth in related industry, and strong growth in computer and mathematical occupations, many of which were clustered in the region. Actual growth was mixed for basic computer-related occupations with computer operators and support specialists seeing declines or a flat growth during the period, but strong employment growth amongst application developers, systems analysts, and database administrators, many of which need further education or significant experience. Students in computer related programs searching or employed saw employment placements below the student average, at 76.8 percent for any placement and 36.0 percent for related placements.

Students in early education related programs of study were expected to see employment above the average of the rest of the student population, with education services projecting for high growth along with education and training occupations (NYSDOL 2005). Teacher's assistants actually saw a decline of almost 13 percent during the period but child care workers and preschool teachers saw increases of 6.5 percent and 14.2 percent during the period. It should be noted that in terms of absolute numbers, teacher's assistants far outweigh the total of child care workers and preschool teachers, at approximately 120,000 to 60,000 in 2005. Actual placement of education students seeking employment or employed was 63.9 percent for related placements and 88.1 percent for all placements, again outpacing the total student body averages.

Engineering Science students were projected to see slightly lower than average placements due to the continued decline in manufacturing and the lack of clustered activities in the region.

Actual employment was mixed, with certain occupational and industry manufacturing areas offsetting areas of growth to result in flat growth in engineering related occupations, such as engineering technicians and drafters, as a whole. Employment placement amongst students looking for work reflected the lower than average projections, with 24.4 percent of students finding related work and 75.6 percent of students finding some form of work.

Program of Study Analysis

Nursing

The first program analyzed was Nursing in all six institutions. In terms of variation of the four activities, all programs have hands on “project” learning in terms of clinic hours. Four of the programs had a variation score of “High” or “Medium to High”: BMCC, KBCC, BCC, and QCC. All but KBCC have a dedicated advisory committee and five out of six have received accreditation from the National League of Nursing. BMCC also offers an internship program during the summer.

Table 6: Nursing Program of Study Rankings by Labor Market Responsive Activities

Program	BMCC	BCC	Hostos	KBCC	LGA	QCC
Nursing	High	Med-High	Low	Med-High	Medium	Med-High

Source: Author Compilation

Despite having a slightly lower variation score, QCC had the highest placement of all schools with 78.8 percent of students placing in jobs that were related to their nursing degree. KBCC, the only program with a *formal* internship program within their curriculum for students that have graduated but have not yet been placed into a nursing position, had the highest rate of professional exams taken and the highest percentage of students who received over \$50,000 in salary per annum.

Table 7: Placement Outcome Statistics of Students in Nursing Programs

School Name (Sample Size)	Placement Rate of Students in “Related”*	% of Students who took professional exam	% of Students prepared with “Knowledge of Field”	% of Respondents making over \$50,000
Borough of Manhattan (N=236)	79.9%	57.6%	94.9%	70.3%
Bronx Community (N=79)	80.2%	64.6%	84.1%	67.0%
Hostos Community (N=26)	66.7%	50.0%	92.4%	42.3%
Kingsborough Community (N=122)	89.9%	67.2%	100%	77.0%
Laguardia Community (N=135)	84.8%	61.4%	99.2%	62.9%
Queens Community (N=185)	86.6%	56.2%	98.3%	75.7%

Source: Author Calculations of Student Graduate Survey Records, 2006-2009, CUNY OIRA

*Excluding students not seeking work

Although it is the smallest sample size (N=26), Hostos was the only program with a placement rate in a “related field” lower than 79 percent, at 66.7 percent. Hostos did not have a dedicated professional advisory committee, but this was also the case with other higher performing programs. The clearest area of differentiation was in accreditation. Hostos was the only program without accreditation from the National League of Nurses Accreditation Commission.

Considering the nature of nursing and the medical field in general, one can conclude professional organizations play a larger role in signaling quality of program graduates.

Accounting

The second program assessed was the Associates degree in Applied Science in Accounting. BCC and Hostos were excluded from this analysis, due to very small sample sizes (12=N and 15=N, respectively). Variation for the remaining programs was as follows:

Table 8: Accounting Program of Study Rankings by Labor Market Responsive Activities

BMCC	KBCC	LGA	QCC
Medium	Low	Medium	High

Source: Author Compilation

Statistics were taken for “related” work, field knowledge, and students making over \$40,000. In addition, as accountants often work in a variety of industries beyond accounting services, which may get lost in the response to this survey, overall placement in work was also included.

Table 9: Placement Outcome and Related Statistics of Students in Accounting Programs

School Name (Sample Size)	Placement Rate of Students in “Related” Work	Placement Rate of Students in Work	% of Students prepared with “Knowledge of Field”	% of Respondents making over \$40,000
Queens Community (N=54)	56.3%	81.3%	94.4%	48.1%
Borough of Manhattan (N=226)	56.2%	79.6%	93.3%	13.2%
LaGuardia Community (N=155)	56.6%	83.9%	84.5%	5.8%
Kingsborough Community (N=124)	32.4%	68.5%	93.5%	16.9%

Source: Author Calculations of Student Graduate Survey Records, 2006-2009, CUNY OIRA

*Excluding students not seeking work

KBCC, which received a variation ranking of low with no formalized efforts at any of the activities included in this analysis, was the lowest performing program amongst the four. Queens Community College had the highest rate of students receiving salaries over \$40,000, in line with their higher variation ranking. Despite this higher aggregate variation rate, QCC did not stand out in terms of placement rates as compared to BMCC and LaGuardia. Taking into account the lack of *required* internship or cooperative education at Queens Community, internships may have an especially important impact on job placement for students. The following tables breaks down program measurements for students in internships according to their response on the student survey.

Table 10: Internship Related Placement Outcome Statistics for Accounting Program of Study

School Name	Student Internship Participation Rate	Percent of all students in related work that interned	Related Placement Rate of Students who Interned*
Queens Community	24.1%	29.6%	61.5%
Borough of Manhattan	45.6%	62.8%	70.3%
LaGuardia Community	36.7%	50.1%	73.2%
Kingsborough Community	17.7%	20.5%	33.3%

Source: Author Calculations of Student Graduate Survey Records, 2006-2009, CUNY OIRA

*Excluding students not seeking work

Student participation in internships was higher at BMCC and LaGuardia than QCC. Looking more deeply at students who performed internships and were employed or seeking work, over 70 percent of students at both BMCC and LaGuardia were able to find work within their field of study. QCC students who performed internships also saw a higher placement rate than their peers who did not perform internships. These numbers indicate the importance of internships as it relates to the accounting field and benefit of internships toward securing future work.

Engineering Science

The third group analyzed was engineering science programs. Engineering science was difficult to assess due to the relative novelty of many of the programs and accompanying low numbers of graduates from CUNY engineering science programs. Additionally, variation in programs was relatively low, with BMCC, BCC, and KBCC not engaging in any of the analyzed labor market activities, which is in line with the more transfer oriented function of the degree. LaGuardia's program was the only engineering science program to stress outside learning through mandatory cooperation education *or* project learning in class (with an option to do both). The sample size for the entire engineering science block was 64 respondents.

Rather than try to extrapolate from the minimal data on placements, commentary on the pursuit of work amongst these graduates may illuminate a different set of questions. Over 70 percent of respondents identified themselves as either working or looking for work, while approximately 54

percent of all respondents were working at the time they filled out the survey. Only a third of those students working were doing so in a position that was related to their field of study. These data suggest two things: (1) most students pursuing degrees in engineering science are not yet taking part in “lifelong learning” where they attend school to build on existing work opportunities; and (2) enhancing part time availability of paid internships in the field may not be an irregular burden as students are already working in jobs unrelated to the field of study.

Computer Information Systems/Computer Science

Due to some varied categorizations in the HEGIS number by schools for computer science and computer information systems programs by the community colleges in this study, a span of programs were included based on HEGIS 510100 & 510300, which will be categorized as “Computer Systems Related” in order to avoid overlap with computer hardware operations curriculum (HEGIS 510400). The use of both categorizations is to include similarly named programs, with the intention of capturing both types of curriculum, pertaining to data processing and computer programming. Hostos was excluded due to a small sample size (N=13).

Table 11: Computer Related Program of Study Rankings by LMI Activities

BMCC	BCC	KBCC	LaGuardia	QCC
Low-Med	Med-High	Low	Medium	Medium

BCC was ranked highest due to their use of an advisory board with relevant professional members, required internship program, and the department accreditation by the Association of Business Schools and Programs (ACBSP) in their A.A.S program. The overall ranking of the hybrid-program was reduced because 11 students included were pursuing an A.S. degree with none of the activities above included within it. QCC received a ranking of medium for accreditation by ACBSP, an industry advisory council (albeit with professionals that were not working in computer related occupations) and an offered internship. LaGuardia received a

ranking of medium based on a required internship and the inclusion of project work in their curriculum. BMCC's low-medium ranking was based on their required internship for the A.A.S. program which made up less than half the hybrid-program response rate.

Table 12: Placement Outcome Statistics of Students in Computer Related Programs

School (Sample)	Placement Rate in Job Market*	Placement Rate of Students in "Related" Work*	% of Students with Knowledge in Field	Students with Salary greater than \$40,000
Borough of Manhattan (N=42)	79.4%	38.2%	85.7%	14.3%
Bronx Community (N=31)	72.4%	48.2%	87.1%	6.5%
Kingsborough Community (N=29)	62.5%	37.5%	72.4%	0.0%
LaGuardia Community (N=32)	85.2%	33.3%	81.3%	3.1%
Queens Community (N=39)	77.8%	27.8%	100.0%	5.1%

Source: Author Calculations of Student Graduate Survey Records, 2006-2009, CUNY OIRA

*Excluding students not seeking work

Variations in program ranking and alignment with job placement outcomes for Computer Science and Computer Information Systems were mixed. BCC had a competitive rate of job placement and the highest rate of related job placement. QCC was a bit of an anomaly in this regard, with the lowest placement rate in "related work" of all programs considered, despite the existence of only an A.A.S program. A possible explanation is that the department advisory board for QCC is made entirely of professionals outside of computer software and design focused industries. In contrast, BCC's advisory board has two members on their business department advisory board in computer technology occupations, illuminating a greater comprehension of issues facing students pursuing information systems degrees. Still, the variations in overall placement rates speak to a possible gap between the intermediaries ability to understand labor demand, affecting the achievement of proper training of students placed into career paths. One aspect of computer-related programs that are less relevant for the other programs are the shifting dynamics of computer related occupations; these rapid evolutions of skills may be making market molding and matching more difficult to undertake, decreasing placement rates and increasing search friction.

Additional calculations were performed to understand the possible effects on transfer of students when coupled with employment placement. While students that engaged in A.A.S. programs (designed for job placement) had lower rates of bachelor or masters pursuit than students in A.S. programs (designed for transfer), students in A.S. that were still seeking employment had lower rates of bachelor or masters pursuit than their counterparts engaged in full time work. Although the sample size for students who were still pursuing full time work was quite small (N=8), samples for A.S. students in full time work related to their field (N=15) and working in some capacity full time (N=39), give an indication that full-time employment is not necessarily a barrier for student transfer. If this is the case, then programs which are focused on student transfer may benefit from enhancing “real-life” work activities in addition to preparation for baccalaureate degrees, as the two are not mutually exclusive.

In addition, A.A.S programs did not outperform A.S. programs in terms of student employment placement, despite their focus on immediate job placement. This supports the advancement of a mission more closely focused on transfer success rather than vocational placement, as the placement benefits from programs more closely aimed at the vocational mission are not being realized. The Computer Science and Computer Information Systems program at LaGuardia is of particular interest, as both programs are housed within the same department and require cooperative education. Students in the Computer Science program outperformed their Computer Information Systems peers at LaGuardia as it regards employment in the field, overall employment, and pursuit of further education.

Educational Associate/Studies

Educational Studies were also assessed using HEGIS 550300, described as “Education – Teacher Aide or Two Year Teacher Training Programs”. Queens Community College was taken out due to a very small sample size (N=4).

Table 13: Education Program of Study Rankings by Labor Market Responsive Activities

BMCC	BCC	Hostos	Kingsborough	LaGuardia
Low-Med	Med-High	Low-Med	Low-Med	Medium

Source: Author Compilation

All programs had some level of practicum or field study involved in their curriculum, a necessity for teaching related degrees. LaGuardia stood out for the additional use of a required internship while Bronx Community College has a dedicated advisory council and offers internships.

Table 14: Placement Outcome Statistics of Students in Education Programs

School (Sample)	Placement Rate in Work*	Placement Rate of Students in “Related” Work*	Knowledge of Field	Percent of Employed Students that found Testing Aid Beneficial
Borough of Manhattan (N=132)	91.6%	63.9%	92.4%	0.0%
Bronx Community (N=54)	84.3%	78.4%	90.7%	69.8%
Hostos Community (N=62)	89.8%	67.7%	85.5%	17.0%
Kingsborough Community (N=129)	86.8%	62.6%	96.9%	30.1%
LaGuardia Community (N=70)	85.4%	51.6%	87.1%	52.8%

Source: Author Calculations of Student Graduate Survey Records, 2006-2009, CUNY OIRA

*Excluding students not seeking work

It should be noted that only three of these programs are A.A.S. degrees (Bronx, Hostos, and Kingsborough), although all five expressly mention preparing students for a career after degree completion. While variation of most program labor market activities are mixed, BCC stands out above all others in its ability to place students in related work, a nod to the dedicated education associate advisory board made entirely of local professionals.

Discussion of Analysis

Variations in the outcomes of job placement, both amongst schools in similar programs and amongst different types of programs, shed light on some interesting relationships between the type of work being performed, the role of industry maturity, and how these factors may enhance or reduce the performance of functional activities LMIs and community colleges in particular can undertake to serve students and employers better.

Standardization and Testing

Of all the types of program of study, Nursing had the best placement rates across the board. Nursing is the most standardized program of study of any of those analyzed, in a field where professionalization is accepted as a barrier to entry for positions and promoted as necessary for the proper performance of the organizations and clients served. In this vein, while variation amongst utilization of three activities seemed to make a minor, if any, difference in the job placement of new graduates, the lack of accreditation at Hostos was displayed to be detrimental to their graduates. It should be noted that nursing has an implicit “creaming” process existing at all institutions, with a limited number of slots available for students to move on into the clinical portion of the program due to limited space. While this is almost certainly an additional factor in the smoothness of the labor market for nurses, it is also another form of certification of quality of graduates of nursing programs.

Ties between other forms of assessment and eventual placement, in this case the nurse’s NCLEX exams, seemed to also exist, with a smaller proportion of nurses taking these exams at Hostos than any other school in the system. Extrapolating to other community colleges or labor market intermediaries in general, there seems to be a relationship between occupations in “mature” industries that have accepted standardized benchmarks as progress of labor skills and a “smoother” labor market. These findings have interesting connotations for the prioritization of

workfare versus education, especially where slack labor demand exists. Where this slack exists, coursework that develops into standardized credentials which are more easily accepted by employers may be more effective than other activities such as on the job training at giving workers greater opportunities coming out of recessionary periods.

Education, a similar field to nursing in the maturity of the occupation and industry served, had the second highest rate of placement related to field of study, employment placement overall, and full time related placements. Education also has standardized methods for assessment through testing, although the tests themselves vary and the “creaming” noted in the nursing program is limited to matriculation of the program. As noted, BCC was considered to have the highest variation rank based on LMI activities studied, and appropriately had the highest level of placement in positions related to field of study, both full time and part time. Approximately 70 percent of students in this program mentioned the benefit of vocational testing available through the school, almost 18 percent higher than LaGuardia, the school with the second highest mention rate. Although the 2006 survey did not ask students to mention whether or not they took a vocationally related test and passed, the surveys from 2007 to 2009 did. Below are the number of students, by school, who answered the survey from education studies programs, the number of students who took a vocational exam, the number of students employed in a related job, and the number of students within that subset who took a vocational test.

Table 15: Professional Exam Related Student Placement Data by Program (HEGIS Code) for Education Related Majors (2007-2009)

Program	Total Students in Program (N)	Students who took vocational exam (% of total)	Students who were placed in related work (% of total)	Related placements – Exam Taken (% of students who took exam)
BMCC	93	19 (20.4%)	57 (61.3%)	14 (73.6%)
BCC	39	16 (41.0%)	28 (71.8%)	12 (75.0%)
Hostos	45	11 (24.4%)	28 (62.2%)	6 (54.5%)
Kingsborough	101	17 (16.8%)	22 (21.7%)	12 (70.6%)
Laguardia	44	8 (18.2%)	22 (50.0%)	5 (87.5%)

Source: Author Calculations of Student Graduate Survey Records, 2006-2009, CUNY OIRA

The percentage of students who took a vocational exam was highest at BCC, the best performing institution in the role of intermediary under the activities assessed. These students had a 75 percent related placement rate, higher than the overall rate of students at BCC who were placed in related work. This phenomenon was true of all schools except Hostos. Although it is difficult to clearly delineate what is responsible for this higher rate of test-taking, BCC is the only school with a dedicated advisory board of professionals of the programs studied. These professionals are able to utilize their greater knowledge of industry to create a highly developed academic and vocational program.

Internships

Whereas internships were less important in the field of nursing and education, they did make a difference in the accounting program of study. Internships are both a form of hands on training for the labor supply and a form of assessment for the employer, allowing organizations to “test” the labor skills of individuals.

Differences between careers in accounting, education, and nursing necessitate some discussion. Internships in accounting, as a field where greater standardization happens later in the career trajectory (i.e. Certified Public Accountant Exam), allow employers to better understand the

capabilities of students while students glean better understanding of expectations of employers and soft skills working in firm environments, enhancing their job prospects. The following chart includes students who were employed or seeking work from Accounting programs of study who had completed internships, the overall rate of placement of non-intern students by each school, students who were involved in internships, and intern rate of placement.

Table 16: Comparison of Students in Accounting Programs – Interns v. Non Interns

Institution Name (Sample Size)	Students Employed or Seeking – Non Interns*	Related Placement Rate – Non Interns	Students Employed or Seeking – Interns*	Related Placement Rate - Interns
BMCC (N=203)	100	42 (42.0%)	103	71 (68.9%)
Kingsborough (N=106)	84	27 (32.1%)	22	7 (31.8%)
LaGuardia (N=144)	87	81 (45.9%)	57	41 (71.9%)
QCC (N=48)	35	19 (54.2%)	13	8 (61.5%)

Source: Author Calculations of Student Graduate Survey Records, 2006-2009, CUNY OIRA

*N Corresponds to all students not seeking employment graduating from the Accounting Program of Study

Rates of related placement amongst students who have participated in internships in all but KBCC's program were higher than those who have not participated. There are two large differences between KBCC's program and the more successful programs at LaGuardia and BMCC. Both of the successful internships programs are required by the school for students who do not currently hold applicable work, whereas KBCC does not formally offer an internship program. Secondly, both BMCC and LaGuardia have pre or co-requisite courses that enrich the internship program through recognition of career paths, greater comprehension of organizational cultures, enhanced networking skills, and the production of a resume or e-portfolio. This supplemental curriculum to enhance the internship program adds to the "soft skills" of individual students and is likely to aid the "work habits and trainability" of students, which are consistently emphasized by employers (Fitzgerald 2000), thereby increasing the benefits of these internship programs when compared to the other two accounting programs.

Computer Science and Computer Information Systems offer an even more muddled picture, but one that may be partially explained by the constant shifts and dynamicism of the industry, occupations, and related technologies, leading to a lack of standardization or assessment and a less full understanding by employers of skill levels of students based on degree completion. A comparison of applied and transfer oriented degrees may help illuminate relationships in related placements or lack thereof.

Table 17: Comparison of Computer Related Degrees A.A.S vs Other (A.S. & A.A.)

Computer Related Degrees Conferred	Percent in Related Jobs	Percent Pursuing School	Percent Working or Seeking Work
A.S. & A.A. (N=53)	15 (28.3%)	43 (81.1%)	46 (86.8%)
A.A.S (N=133)	44 (33.1%)	85 (63.9%)	115 (86.5%)

Source: Author Calculations of Student Graduate Survey Records, 2006-2009, CUNY OIRA

While there seems to be a clear delineation between students who pursue further education after completing A.A.S degrees and those who take on degrees meant for baccalaureate transfer, the majority of students receiving both degrees are pursuing work and pursuing further education. This lends credence to Dougherty's assessment that students that receive two year degrees, even with the focus on employment placement, are likely to continue to go from more "technical" training into higher degrees (Dougherty 2003). This phenomenon is also in line with "advanced and continuing learning" noted by Benner et al as a "market making" activity, enhancing workers eventual mobility in career paths (Benner, Leete et al 2007).

Project Based Learning and Industry Advisory Councils

Drawing conclusions from data on project based learning was difficult due to the lack of variation between types of learning of programs in similar fields of study. For instance, nursing and education project based learning was required at all schools, while this form of learning in accounting programs was non-existent. The only differentiation was between computer science and computer information systems programs. Impact in this area was minimal.

Industry advisory councils were also difficult to draw conclusions from without further questioning of department faculty and staff on how these professionals may take part in curriculum updates. Still, stronger placement rates at BCC for the analyzed programs with advisory councils did exist.

Alternate sources of causation

While data provided in this analysis is not able to completely rule out alternate hypotheses – indeed, other causal relationships are expected at the level of the individual as it relates to job placement – noting and identifying sources of alternative causation aid the robustness of the analysis. Race discrimination has traditionally been noted as a problematic area in terms of hiring by firms (Neckerman and Kirschenman 1991; Darity and Mason 1998). The table below gives demographic information at the institutional level to clarify some of the gender and racial demographics of the institutions in this study.

Table 18: Race and Gender Characteristics of Examined Community Colleges

Category	BMCC	Bronx	Hostos	KBCC	LaGuardia	QCC
Male	38%	37%	28%	41%	37%	41%
Female	62%	63%	72%	59%	63%	59%
Asian & Pacific Islander	14%	4%	4%	12%	21%	24%
Black	40%	42%	32%	33%	22%	28%
Hispanic	31%	51%	60%	14%	39%	22%
White	16%	3%	4%	41%	18%	25%

Source: 2009 Student Experience Survey, CUNY OIRA

KBCC had by far the largest white population of any institution in the study. Despite this, KBCC ranked last in two of the programs of study analyzed in terms of job placement. Other than their nursing program, KBCC also fell behind peer schools in percent of students who earned over \$40,000 in income. While not leading to a conclusive stance on the effects of community college labor market activities and reduced racial discrimination, these numbers do allow for some headway in recognizing other possible causality in lower job placement rates, such as lack of

participation in internships. It is possible firm engagement activities, such as internships, encouraged or required that minority students enhance their work experiences, one of the noted differentiators in interview processes (Neckerman and Kirschenman 1991), thereby serving as a mechanism to reduce disadvantages. Gender bias is more difficult to analyze due to closer proportions of student populations – except for Hostos and KBCC – and the inclusion of majority-female occupations such as nursing and teaching. Still, the close proportions of school gender populations should reflect similar distributions by gender amongst similar programs of study at various institutions.

Another area of possible alternate causality is resources available to students. Although thorough breakdowns of financial resources by department and program are unavailable through CUNY, I have used proxy indicators in their absence. Faculty satisfaction data are taken from the latest the 2008 student experience survey, a midpoint of the period studied. Total operating budgets for each institution were determined using 2009-2010 budget allocations and divided by fall 2009 full-time enrollment equivalent student enrollment levels to create a number for institutional dollars per student.

Table 19: Student Satisfaction with Faculty Availability and Dollars per Student by Institution

Program Name	Student Satisfaction with Faculty Availability	Dollars per student
Borough of Manhattan Community	56.3%	\$ 6,726.06
Kingsborough Community	57.2%	\$ 5,613.73
Laguardia Community College	53.2%	\$ 6,728.18
Queens Community College	56.1%	\$ 6,790.26
Bronx Community College	58.1%	\$ 8,017.24
Hostos Community College	57.9%	\$ 10,102.62

Source: CUNY Community College Five- Year Enrollment Trends & 2009-2010 Community College Budget Allocation Memo

Faculty availability was similar across the board. While funding for Hostos students at the institutional level was higher than other schools in this study, this did not positively affect the

placement outcomes in the nursing or education programs of study, where Hostos was included for analysis.

Finally, arguments regarding causation between social networks and employment have also been made, exploring the role of social capital and benefits regarding a richer pool of applicants and better employee-employer matches, amongst other effects (Fernandez et al 2000). As Benner et al point out using indicators of social capital in their analysis, individuals with greater social capital were more likely to use community colleges as their preferred LMI, in contrast to those with less social capital, who were likely to use temporary staffing agencies. The survey touched on job referrals made available by the career office, the results of which are analyzed below.

Table 20: Job Referrals by Program of Study Analyzed – All Institutions

Program of Study	Percent of Students Receiving Job Referrals
Nursing	38.4%
Accounting	34.5%
Computer Science/Info Systems	31.7%
Engineering Science	30.2%
Education Associate/Studies	34.8%

Source: Author Calculations of Student Graduate Survey Records, 2006-2009, CUNY OIRA

Job referrals through community colleges can replicate the benefits and successes accrued from social capital by imitating the employment referral process. About a third of responses from all programs noted that they had received job referrals through their schools. While it is impossible to compare these rates to use of social capital by the remaining students who did not receive job referrals, it can be said that at least 30 percent of workers in all programs analyzed received similar benefits of networking available through social capital.

Chapter 5: Conclusion

Policy and Planning Implications

Alignment of Available Training

The cluster analysis done for this project shed some light on the availability of programs related to industry and occupational clusters. Without existing or developed programs specifically to cater to areas of new or existing local employment demand, enhanced intermediary activities are likely to have little benefit to students or firms in developing sectors of the regional economy.

Projections of industry-occupation outcomes extrapolated down to the regional level were mostly accurate in predicting the direction and somewhat accurate in predicting magnitude of employment changes in a volatile economic environment, making them helpful tools in assessing resource distribution for community colleges and departments.

Economic and Workforce Development Integration

Professionals in both workforce and economic development would be well served by reducing the gap between economic development efforts and workforce development. While there are areas of workforce-economic development alignment in New York's cluster targeting strategy - most notably city-wide targeting and training services by community colleges in financial services and arts and media - the city's efforts at recruiting green industry and manufacturing suffer from a lack of connectivity between broad based industry recruitment efforts and upgrading related labor infrastructure. While the efforts to target manufacturing are already questionable strictly given the projections going forward and the region's weakness in the industry, there is currently only one program dedicated to computerized manufacturing amongst

the six CUNY two year institutions. The city's economic development strategy becomes undermined by a lack of related human capital infrastructure.

Community colleges can also respond to enhance alignment with industry. As an LMI, community colleges should work to enhance outreach to workers through marketing of greater employment opportunities in underutilized programs. One example is the nuclear medicine technology program of study at Bronx Community College. BCC is the only school that offers nuclear medicine technology, an aspect of the biotech cluster the city is looking to enhance, yet enrollment and matriculation rates are far lower than other programs in careers with less local demand.

Testing Standardization and Other Forms of Evaluation

Both nursing and education programs of study, which serve mature industries where occupational standards have been built over time, performed better at market matching and molding activities, based on higher than average related placement rates and higher test-taking rates. The implication from this analysis is that standardization is beneficial for employer assessment, based on performance of institutions with accreditation (nursing) and higher related placement rates for test takers (education). Nursing was the "smoothest" of all labor markets in this analysis, while education was second. In the aggregate, students who took exams in both fields were more likely to find related work to their field of study. The numbers demonstrate a positive impact on students' job placement as a result of promoting accreditation and professional relevance of testing qualifications in industries where technologies are evolving less rapidly and traditional forms of assessment can be utilized.

Synergies and Redundancies in Educational and Vocational Missions

Despite the appearance and existence of conflicting missions, there are certain programs of study that may benefit from a reimagining of synergies in their similarities. In the instance of computer science and computer information systems, LaGuardia and BCC, both of which offer computer science and computer information systems degrees, saw little difference in the related placement level of students from either program in comparison. Similar research into areas where assessment is difficult due to the changing nature of occupations in the field warrant further attention as to whether these phenomena are occurring in other similar programs of study. If the ultimate goal of “applied science” degrees is to better job placement, community colleges must reassess whether or not this goal is being served by the existing degrees created for transfer purposes.

Internships

Standardization through testing is not an effective means of assessment in all industries, creating a need for more direct evaluation of workers. Internships were a key indicator for future employment amongst accounting students in a field where the test to become a Certified Public Accountant occurs only after a worker has attained a four year degree. In addition, internships have both the benefit of allowing firms to “test” workers, retaining those they find acceptable, as well as providing greater networks for workers in the career field.

Comprehensive Outreach and Response Programs

One of the recently developed programs for intensifying the responsiveness of community colleges to local and regional demands, creating greater value for students, is the Career Pathways program. Career Pathways is a process for identifying gaps in local labor markets, both in supply and demand, understanding current offerings and choosing sectors of focus. Once initial “gap analysis” is undertaken, planning at the administrative level is done to identify

partners, enhance their participation, and formalize stakeholder roles. Special attention is paid to employers in partnerships to enhance commitment and identify possible routes for enhanced career mobility for individuals in the labor force (Alssid, Gruber et al 2002)

Career Pathways are comprehensive in their identification of gaps in the labor market and focus on partnerships with local employers to better understand local labor demand and how delivery of training may lead to enhanced human capital in the labor supply. Yet comprehensive strategies are often both time and funding intensive. Featured in this paper are formal structures already in place for community colleges to build upon while formulating more in depth analyses that lead to Career Pathways systems should they decide to take on greater vocational roles.

While not a replacement for career pathway services, these implications outline a point from which community colleges can better achieve their vocational goals through existing mechanisms, while reducing the spread of resources to more comprehensive systems in the short term.

Future Research

As it pertains to the recommendations for future study by Benner et al, the work done here adds a new, but limited dimension on the activities undertaken by community colleges as labor market intermediaries. Both the depth of activities and the types of intermediaries that perform this task must be further analyzed in order to add to the empirical body of work so that labor market intermediaries may better serve labor market participants. Market meeting and molding activities included in this paper make for interesting parallels in regards to similar functions of other labor market intermediaries. Research into market making activities, which were not analyzed in this paper, are also ripe for analysis.

Evidence regarding similar employment placement with applied and transfer oriented degrees also bring up questions of degree dispersion and the intended benefits of varied curriculum which leads workers to similar career paths. Further study of degree programs with similar curriculum but different goals of transfer and career placement would help to enrich literature on how students acclimate to entering the labor market and enhance comprehension of how educational goals can be melded with career placement goals of community colleges. In addition, research into the employment participation of students that attain two year degrees, and eventual matriculation into four year programs, would help to understand the role of career employment in promoting further educational attainment.

Finally, resilience of certain programs study and corresponding career fields in the face of recessionary economic environments, begs the question of whether the promotion of certain degrees are better suited for slack and tight labor markets. Issues related to the maturity of industry, professional nature of occupations, and dynamicism of knowledge within career fields are of particular interest.

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